Testimony Concerning the Discrimination Faced by Minority-Owned and Women-Owned Business Enterprises in the Transportation Sector

Before the Committee on Transportation and Infrastructure
United States House of Representatives

September 23, 2020

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Testimony of Dr. Jon S. Wainwright

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Chairman DeFazio, Ranking Member Graves, and Members of the Committee:

Thank you for the invitation to appear here today. My name is Jon Wainwright. I hold a Ph.D. in economics from the University of Texas at Austin. Until my recent retirement after 24 years, I served as a Managing Director at NERA Economic Consulting in Austin, Texas and Chicago, Illinois. NERA is a national and international economic consulting firm dedicated to applying economic, finance, and quantitative principles to complex business and legal challenges. One of my primary areas of interest as a professional economist has been documenting and analyzing the effects of discrimination on minorities, women, and other disadvantaged groups.

I would like to ask the Committee's permission to include my entire testimony in the record as if read in full and to supplement my testimony with additional material if needed.

A. Introduction

I have been asked to provide a statistical overview of the historical and current state of Minority-Owned and Women-Owned Business Enterprise (M/WBE) in the United States, for the economy as a whole and particularly in those industry sectors relevant to federal surface and aviation transportation funding.

My findings are drawn from evidence in numerous studies of M/WBE participation in public sector contracting activity that have been performed in the wake of the U.S. Supreme Court's ruling in *City of Richmond v. J. A. Croson Company*,[1] many of which I conducted myself. These disparity studies examine statistical evidence of M/WBE participation in public sector and private sector business activity compared to M/WBE representation in the relevant business populations, and offer explanations for the disparities observed between these factors. They also include qualitative, or anecdotal, accounts from both M/WBEs and non-M/WBEs regarding these disparities.

Additionally, I have drawn findings from the few primary sources of statistical evidence that exist regarding M/WBEs, namely the Census Bureau's historical *Survey of Business Owners*, its new *Annual Business Survey*, and its ongoing *American Community Survey*. The *Survey of Business Owners* and its recent successor, the *Annual Business Survey*, provide information regarding the total number of M/WBEs in the country, their gross sales and receipts, and their employment and payroll, both in absolute terms as well as relative to their nonminority, male-owned counterparts. The *American Community Survey* is an annual version to the old decennial census long form and provides evidence regarding patterns of business formation by minority

[1] 488 U.S. 469 (1989).

and female entrepreneurs and associated business earnings relative to their nonminority, male-owned counterparts.

In preparing this testimony, I conducted extensive original research using all of the above-mentioned sources of evidence. This research is a continuation of similar research I have performed over the course of my career as an economist. Based on the findings presented below, I conclude that there is strong evidence, both past and present, of large, adverse, and statistically significant disparities facing minority-owned and women-owned business enterprises in the United States. Moreover, these disparities cannot be explained solely, or even primarily, by differences between the relevant populations in factors untainted by the effects of discrimination. These disparities are primarily due to discrimination and its effects, in the economy as a whole, as well as in the markets such as construction, architecture, and engineering that most relevant to federal surface and aviation transportation funding.

1. Qualifications

I hold a Ph.D. in economics from the University of Texas at Austin. My graduate curriculum included advanced courses in statistics, econometrics and labor economics, among others. Prior to joining NERA in 1995, I served as a Research Associate Professor at the Lyndon B. Johnson School of Public Affairs at the University of Texas at Austin and also headed my own economic consulting firm. While at NERA, I conducted economic and statistical studies of discrimination for attorneys, corporations, governments and non-profit organizations. I also conducted research and advised clients on adverse impact and economic damage issues arising from contracting activities, hiring, termination, performance assessment, compensation, and promotion. I have extensive experience producing, processing, and analyzing large and complex statistical databases, including public sector contracting and purchasing data, as well as with myriad socioeconomic and demographic datasets produced by the Census Bureau and other official statistical agencies.

Over the course of my career, I have conducted economic and statistical research and assisted in litigation concerning the minority and female participation in public contracting activities. From 2004 through 2018, I directed NERA's national discrimination consulting practice. In that capacity, I served as the project director and principal investigator for more than 40 studies of business discrimination, and prior to that time as principal or co-principal investigator on approximately a dozen additional business discrimination studies. I have authored two peer-reviewed monographs and several articles and white papers on this and related subjects, including *Guidelines for Conducting a Disparity and Availability Study for the Federal DBE Program*, published in 2010 by the *Transportation Research Board* of the *National Academy of Sciences*.

Between 2010 and 2013 I served as the principal economic and statistical expert on behalf of the U.S. Department of Justice, testifying in four cases challenging federal policies to promote participation by minority-owned and/or women-owned businesses in federal contracting activities. These were:

- *Kevcon, Inc. v. The United States* (United States Court of Federal Claims), concerning the Small Business Administration's 8(a) minority business set-aside program.[2]

- *Geyer Signal, Inc. and Kevin Kissell v. Minnesota Department of Transportation, et al*. (United States District Court for the District of Minnesota), concerning the USDOT Disadvantaged Business Enterprise Program.[3]

- *Midwest Fence Corporation v. United States Department of Transportation, et al*. (United States District Court for the Northern District of Illinois, Eastern Division), concerning the USDOT Disadvantaged Business Enterprise Program.[4]

- *Rothe Development, Inc. v. Department of Defense and Small Business Administration* (United States District Court for the District of Columbia), concerning the Small Business Administration 8(a) minority business set-aside program.[5]

I have been repeatedly qualified as an expert economic and statistical witness in both federal and state courts and have testified in these and related matters on 20 occasions. I have also testified before the United States Congress on these matters on five previous occasions.

My current curriculum vitae is attached to this testimony. The source material relied on in reaching my findings and conclusions are noted below in the body of my testimony.

2. Discrimination and its Effects, Historically and Currently, Consistently Disadvantages Minority- and Women-Owned Business Enterprises

As other researchers have noted, and as demonstrated in many of the studies, reports, and other testimony submitted to Congress, minorities and women have been historically and consistently disadvantaged by the effects of discrimination in business enterprise.[6] Despite progress in some areas, these disadvantages are still present in business markets.[7] As my testimony demonstrates, although severe disparities persist between non-minority male owned firms and minority- and women-owned firms, we are making progress thanks to programs like the Disadvantaged Business Enterprise Program. Still, now is no time to reduce our efforts to eliminate business discrimination and its effects. Indeed, much of the progress that has been achieved is due to the effect that programs like the DBE program have had. The evidence is overwhelming that, were we to eliminate or reduce these programs, much greater disparities would very quickly occur. The best metaphor I can think of is the person who takes blood pressure medicine. If we take that person's blood pressure while they are taking their medicine, their blood pressure will appear

[2] Wainwright, Jon S. (2010).

[3] Wainwright, Jon S. (2012).

[4] Wainwright, Jon S. (2013b), (2013c).

[5] Wainwright, Jon S. (2013a).

[6] *See*, *e.g.*, U.S. Department of Commerce (2015); Lowrey (2010a); Lowrey (2010b); Marshall (2002); Wainwright (2000).

[7] *See,* generally, U.S. Small Business Administration (2010).

normal but that does not mean that any responsible doctor would argue that the person should stop taking their blood pressure medicine. This is precisely why I and other researchers in this area try to examine both the public sector contracting markets where affirmative measures like the DBE program are found as well as the private sector contracting markets where such programs are much more rare. This is also why, although my testimony includes voluminous data from public sector sources like disparity studies, I also include a great deal of information from Census sources which examine markets that are largely unremediated by programs like the DBE program.

African Americans are 13.3 percent of the general population, 12.6 percent of the civilian labor force, and 12.2 percent of total employment. However, at last count, African Americans owned only 9.5 percent of the nation's businesses, and earned a mere 1.26 percent of all business sales and receipts.[8]

Hispanics are 18.2 percent of the general population, 17.1 percent of the civilian labor force, and 17.0 percent of total employment. However, at last count Hispanics owned only 12.2 percent of the nation's businesses, earned less than 4.0 percent of all business sales and receipts.

American Indians and Alaska Natives are 1.3 percent of the general population, but they are only 1.0 percent of the business population and earned just 0.32 percent of business sales and receipts.

Asians and Pacific Islanders represent 6.1 percent of the general population, 6.2 percent of the civilian labor force, and 6.2 percent of total employment. While Asians own 7.1 percent of the nation's businesses, they earned only 5.9 percent of business sales and receipts.

Women represent 50.9 percent of the general population, 46.9 percent of the civilian labor force, and 46.9 percent of total employment. However, they are only 36.4 percent of the business population and earn only 11.9 percent of business sales and receipts.

Even those minorities and women who manage against the odds to start their own businesses must compete in a business enterprise system that has long been dominated by non-minority male-owned firms.[9] The advantages enjoyed by non-minority males in this context are borne out in the statistics. In a groundbreaking pair of studies of employer business closure rates, Professor Ying Lowrey documented that existing African American-owned, Hispanic-owned, Asian and Pacific Islander-owned, and women-owned businesses across a wide variety of industry groups suffered substantially higher closure rates during the 2002-2006 period than did their nonminority male counterparts.[10] More recently, Professor Rob Fairlie has shown that African

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[8] General population statistics are from the U.S. Census Bureau (2017a); civilian labor force and total employment figures are from the Bureau of Labor Statistics (2018a, 2018b, 2018c); business enterprise statistics are from the *2012 Survey of Business Owners*, U.S. Census Bureau (2018b). Note: Publicly-owned companies have been excluded from all calculations in this report that use *Survey of Business Owners* or *Annual Business Survey* statistics.

[9] *See*, *e.g.*, Wainwright (2000), pp. 17-22, and the studies cited therein.

[10] Lowrey, Ying (2010a), pp. 20-21; Lowrey, Ying (2010b), p. 16. The comparison was between non-publicly held establishments that were in business in 2002 but had closed by 2006 versus all non-publicly held establishments in business in 2002.

American, Hispanic Asian, American Indian and Alaska Native, and female small businesses closed at higher rates than their non-minority male counterparts during the first month of widespread COVID-19 induced shelter-in-place restrictions in April of this year.[11]

Even among larger firms, such as those with one or more paid employees, the disparities between minorities and women, on the one hand, and non-minority males, on the other, are stark. In 2017, for every dollar in sales and receipts earned by non-minority male-owned employers, African American-owned employers earned 45 cents, Hispanic-owned employers earned 57 cents, Asian and Pacific Islander-owned employers earned 63 cents, American Indians and Alaska Native-owned employers earned 67 cents, and women-owned employers earned 61 cents.[12]

The overwhelming majority of businesses have less than 10 employees, and only a small fraction have more than 500 employees. Minority- and women-owned firms are over-represented in the former category and under-represented in the latter. For the smallest firms in 2017 (the most recent data available), 78 percent of non-minority male-owned firms had less than 10 employees, compared to 82.1 percent of African American-owned firms, 82.3 percent of Hispanic-owned firms, 81.2 percent of Asian and Pacific Islander-owned firms, 82.2 percent of American Indian and Alaska Native-owned firms, and 82.2 percent of women-owned firms.[13] For the largest firms in 2017, 0.21 percent of nonminority-owned male firms had 500 or more employees, compared to 0.12 percent of African Americans, 0.1 percent of Hispanics, 0.07 percent of Asians and Pacific Islanders, 0.11 percent of Native Americans, and 0.1 percent of women.[14]

B. Studies Conducted Since 2000 Provide Strong Evidence of Disparities Against Minority- and Women-Owned Businesses

As mentioned above, between 2010 and 2013 I served as an expert witness on behalf of the U.S. Department of Justice in its defense of two challenges to the SBA 8(a) Program and two challenges to the USDOT DBE Program. As part of this work, I collected and reviewed every known study of M/WBE disparities published since 2000.

1. Data and Methods

Table 1 identifies 95 studies of minority and female business enterprise completed between 2000 and 2012. These studies examined M/WBE participation in public contracting and procurement for 127 different public entities and/or funding sources. The studies span 32 different states that collectively account for over 80 percent of the general population of the United States.[15] Of the 95 studies, 21 were conducted under my direction. Over the course of these studies, I personally

[11] Fairlie, Robert (2020). p. 16.

[12] U.S. Census Bureau (2020a). For employer firms, the most recent data are from the 2017 Annual Business Survey, released in May 2020.

[13] U.S. Census Bureau (2018b, 2018c 2018d).

[14] *Ibid*.

[15] U.S. Census Bureau (2011e).

examined and analyzed tens of billions of dollars worth of public sector spending across tens of thousands of contracts and subcontracts. The remaining 74 studies covered an even larger number of public contracts and public dollars.

All of the disparity studies in Table 1 examined minority-owned business enterprises as well as non-minority women-owned business enterprises. Typically, M/WBEs include businesses owned by African Americans, Hispanics, Asians and Pacific Islanders, American Indians and Alaska Natives, and non-minority women.

A wide variety of government types are represented as well in these disparity studies. Some studies encompassed the entire state (*i.e.*, Indiana, Maryland, Minnesota, New York, Texas, and Virginia), others were performed for single state agencies (*i.e.*, Department of Transportation studies in Alaska, Arizona, California, Colorado, Georgia, Hawaii, Idaho, Illinois, Kansas, Maryland, Minnesota, Missouri, Montana, Nevada, North Carolina, Oklahoma, Oregon, Virginia, and Washington and the Division of Capital Asset Management and the Housing Finance Agency in Massachusetts), others were done for cities (*i.e.*, Atlanta, Augusta, Austin, Baltimore, Boston, Charlotte, Cincinnati, Columbia, Dayton, Denver, Durham, Fort Worth, Houston, Kansas City, Memphis, Milwaukee, Minneapolis, Nashville, Philadelphia, Phoenix, Portland, San Antonio, St. Louis, St. Paul, Tallahassee, Tucson, and Tulsa), others covered counties (*i.e.*, Pima, AZ; Broward, FL; Leon, FL; Richmond, GA; Wyandotte, KS; Durham, NC; Davidson, TN), and still more were for a variety of special districts including schools, public utilities, housing authorities, airports, and transit agencies.

All 95 studies identified included contracts and procurements for public works in construction, and a large majority also included contracts in the construction-related professional services ("CRS") sector, which includes architecture, engineering, and related services. Construction and CRS activities include the public works performed by highway departments, transit agencies, and airports under USDOT jurisdiction.[16]

Many of the disparity studies in Table 1 encompass public contracting and purchasing activities in other industry sectors as well. This reflects the fact that state and local governments, and their prime contractors and vendors, purchase goods and services from practically every major industry. In addition to construction and CRS, these include agriculture, mining, utilities, transportation, wholesale trade, retail trade, finance and insurance, real estate, professional and technical services, administrative and support services, waste management services, educational services, health care and social assistance services, food services, and others. NERA's most recent study for the State of Maryland, for example, encompassed 695 distinct industries.[17]

In addition to covering construction, CRS, and other industries, the 95 studies in Table 1 span the country geographically, representing all four Census Regions and all nine Census Divisions. In

[16] Construction prime contractors and subcontractors also purchase a variety of supplies and materials (*e.g.*, steel, concrete, asphalt), as well as trucking services.

[17] NERA Economic Consulting (2017), p. 45. However, public sector spending is not typically distributed evenly among industries. In the State of Maryland's case, 261 industries (38 percent) accounted for 99 percent of all spending over the study period.

all, 32 states plus the District of Columbia are represented here, as well as 53 of this Committee's 67 members.

As part of my work on behalf of USDOJ, I reviewed all of 95 studies identified in Table 1. Typically, these studies include an Executive Summary, a review of case law pertaining to M/WBEs, a review of the government's purchasing and contracting policies as they pertain to M/WBEs, a chapter estimating the availability of M/WBEs, a chapter estimating the utilization of M/WBEs, a chapter comparing availability and utilization to assess disparities, and a chapter examining anecdotal evidence of discrimination. Often, these disparity studies also included one or more chapters examining evidence of disparities and discrimination in the wider market area, surrounding a particular government's jurisdiction. These are referred to as "private sector" or "economy-wide" analyses.

2. Findings

Each study is different. They were prepared by different consultants, for different governments, in different parts of the country, with differing levels of resources. They examined different periods of time and used a variety of methods for assessing utilization, availability, and disparity, and for gathering anecdotal information.[18]

Nevertheless, the striking similarities among these studies strongly outweigh the differences. Foremost among these is an almost universal finding that historical and contemporary discrimination adversely impacts all different types of M/WBEs throughout the United States, in the construction sector, the CRS sector, and in other industry segments as well.

To begin to see this, Table 2 presents specific statistical findings from the studies listed in Table 1. One primary function of a disparity study is to gather information on a government entity's prime contracting and subcontracting activity during the time period being studied. Since the federal DBE Program applies to both prime contracting and subcontracting, I focused my review on the combined utilization of M/WBEs as both prime contractors and subcontractors.[19]

I reviewed each study's findings concerning:

- The percentage utilization of M/WBEs in construction spending,
- The percentage availability of M/WBEs for construction spending,

[18] A detailed discussion of the differences in methods employed by different consultants is provided in Wainwright and Holt (2010), pp. 29-53.

[19] Depending on how any given study's statistics were presented, I had to carry out certain additional calculations in order to present the information in Table 2 in a consistent manner. For example, a study might show the total number of prime contract construction dollars accruing to M/WBEs in one table, the total number of subcontract construction dollars accruing to M/WBEs in another table, and the total number of construction dollars overall in yet another table. Calculating overall M/WBE prime contract and subcontract utilization thereby required adding the figure in the first table to the figure in the second table and dividing the sum by the figure in the third table. These figures, in turn, might then be combined with availability statistics from one or more tables in the study in question to form the relevant disparity index.

- The percentage utilization of M/WBEs in CRS spending, and
- The percentage availability of M/BEs for CRS spending.

Several appear more than once in Table 2 since they provided statistical evidence in more than one relevant category. Columns (1) and (2) in Table 2 identify the state and political subdivision for which each disparity study was performed. Columns (3) and (6) present the utilization statistics for construction and CRS, respectively. Columns (4) and (7) present the availability statistics for construction and CRS, respectively. Columns (5) and (8) present the disparity indexes for construction and CRS, respectively. Column (9) indicates the years covered by each study. Column (10) provides the page citations for the statistical data presented.

The disparity indexes presented in column (5) for construction and column (8) for CRS are formed by dividing the M/WBE utilization percentage by the M/WBE availability percentage, and multiplying the result by 100. A disparity index of 100 or more indicates that M/WBEs are being utilized at or above their market availability level. A disparity index of less than 100 indicates that M/WBEs are being utilized at or below their market availability level. A disparity index of 80 or lower is commonly taken as an indicator that discrimination is adversely affecting M/WBEs.[20]

The substantial majority of the disparity studies reviewed and presented in Table 2 identified large adverse disparities affecting M/WBEs in both construction and CRS.[21] There are 206 disparity indexes altogether—127 for the construction sector and 79 for the CRS sector.

- In construction, 74 of 127 disparity indexes, or 58 percent, fall at or below 80; and 91 of 127, or 72 percent, are less than 100.
- In CRS, 59 of 79 disparity indexes, or 75 percent, fall at or below 80; and 61 of 79, or 77 percent, are less than 100.
- Combining the results from both industry sectors, 133 of 206 disparity indexes, or 65 percent, fall at or below 80; and 152 of 206, or 74 percent, are less than 100.

Notably, the general consistency of these results occurs despite these studies having been undertaken by different consultants, using differing methods, at different points in time, with different budgets, and for a wide variety of state and local government agencies in a wide variety of geographic locations. Perhaps most notably, these disparities exist *despite the fact that, in the overwhelming majority of studies there was a strong, mature MBE or DBE program in place aimed at eliminating disparities.* In other words, these disparities are so powerful and so severe that even strong efforts to level the playing field are simply not enough to eradicate them.

[20] Although not the same as statistical significance, the "four-fifths rule" says that a disparity index of less than or equal to 80 (on a scale of zero to 100, zero being perfect disparity and 100 being perfect parity), because it is large, or "substantively" significant, indicates the presence of discrimination. *See* 29 C.F.R. § 1607.4(d).

[21] In Table 2, disparity indexes of 80 or lower are highlighted in boldface type. Disparity indexes above 80 but still less than 100 (which would indicate parity with non-M/WBEs) are highlighted in boldface italicized type.

Eleven different consultants produced the studies in Table 2. However, just four firms produced 75 percent of these studies: MGT of America, NERA Economic Consulting, BBC Research & Consulting, and Mason Tillman Associates.

- Of the 34 construction disparity indexes from MGT of America, 20 (59 percent) are less than or equal to 80 and 26 (76 percent) are less than or equal to 100. Of the 15 CRS disparity indexes from MGT, 12 (80 percent) are less than or equal to 80 and 12 (80 percent) are less than or equal to 100.

- Of the 24 construction disparity indexes from NERA Economic Consulting, 16 (67 percent) are less than or equal to 80 and 17 (71 percent) are less than or equal to 100. Of the 20 CRS disparity indexes from NERA, 10 (50 percent) are less than or equal to 80 and 11 (55 percent) are less than or equal to 100.

- Of the 23 construction disparity indexes from BBC Research & Consulting, 13 (57 percent) are less than or equal to 80 and 17 (74 percent) are less than or equal to 100. Of the 20 CRS disparity indexes from BBC, 17 (85 percent) are less than or equal to 80 and 17 (85 percent) are less than or equal to 100.

- Of the 17 construction disparity indexes from Mason Tillman Associates, 13 (76 percent) are less than or equal to 80 and 16 (94 percent) are less than or equal to 100. Of the 12 CRS disparity indexes from Mason Tillman, 10 (83 percent) are less than or equal to 80 and 10 (83 percent) are less than or equal to 100.

- Of the 29 construction disparity indexes from the balance of consulting firms in Table 2, 12 (41 percent) are less than or equal to 80 and 15 (52 percent) are less than or equal to 100. Of the 12 CRS disparity indexes from the balance of consulting firms, 10 (83 percent) are less than or equal to 80 and 11 (92 percent) are less than or equal to 100.

Some specific results in Table 2 are highlighted below:

- Of the 33 state DOT construction disparity indexes, 26 (79 percent) are less than or equal to 80 and 29 (88 percent) are less than or equal to 100. These include Alaska, Arizona, California, Colorado, Georgia, Hawaii, Idaho, Illinois, Kansas, Minnesota, Missouri, Nevada, North Carolina, Oregon, Texas, Virginia, and Washington.

- Of the 24 state DOT CRS disparity indexes, 23 (96 percent) are less than or equal to 80 and 23 (96 percent) are less than or equal to 100. These include Arizona, California, Colorado, Georgia, Idaho, Illinois, Missouri, Montana, Nevada, North Carolina, Oklahoma, Oregon, Virginia, and Washington. Only Hawaii was found to have consistently utilized M/WBEs at or above their estimated availability in CRS.

- Of the 11 statewide (excluding DOTs) construction disparity indexes, 7 (64 percent) are less than or equal to 80 and 10 (91 percent) are less than or equal to 100. Of the 4 statewide (excluding DOTs) CRS disparity indexes, 3 (75 percent) are less than or equal to 80 and 4 (100 percent) are less than or equal to 100.

- Of the 41 city or county construction disparity indexes, 19 (46 percent) are less than or equal to 80 and 25 (61 percent) are less than or equal to 100. Of the 22 city or county CRS disparity indexes, 13 (59 percent) are less than or equal to 80 and 13 (59 percent) are less than or equal to 100.

- Of the 39 special district (*e.g.*, transit agencies, airports, housing authorities, school districts) construction disparity indexes, 23 (59 percent) are less than or equal to 80 and 27 (69 percent) are less than or equal to 100. Of the 28 special district CRS disparity indexes, 20 (71 percent) are less than or equal to 80 and 21 (75 percent) are less than or equal to 100.

Finally, in almost all of the studies presented, the statistical findings are accompanied by anecdotal evidence of discrimination against M/WBEs.[22] Many of these studies also include statistical evidence of disparities in the surrounding private sector—in minority and female business formation rates, business owner earnings, and access to commercial loans and capital. This type of statistical evidence is especially important since it helps explain why the large and adverse disparities observed for M/WBEs can be attributed to discrimination rather than to other, non-discriminatory factors.

3. Conclusions from the Disparity Study Data

According to my records, there are at least another 150 disparity studies that have been completed since I finished my work for USDOJ in 2013. There is no doubt in my mind that were I to conduct a comparable analysis on these latest studies, I would find similar results—large and adverse disparities that continue to face M/WBEs throughout the country. In the next two sections of my testimony, I examine the most recent Census Bureau data with respect to M/WBEs.

[22] *See also*, *e.g.*, U.S. Small Business Administration (2010), Aparicio (2009), Asian American Justice Center (2008), Lau (2009), Quon (2008), U.S. Congress (2007), (2008), (2009a), (2009b), and (2009c).

Table 1. Selected Disparity and Availability Studies Performed in the United States Between 2000-2012.

State	Subdivision	Author	Type of Study	Year Completed
AK	Department of Transportation and Public Facilities	D. Wilson Consulting Group, LLC	Disparity	2007
AZ	Arizona Department of Transportation	MGT of America, Inc.	Disparity	2009
AZ	City of Phoenix	MGT of America, Inc.	Disparity	2005
AZ	City of Tucson	D. Wilson Consulting Group, LLC	Disparity	2008
AZ	Pima County	D. Wilson Consulting Group, LLC	Disparity	2008
CA	Bay Area Rapid Transit (BART)	Mason Tillman Associates, Ltd.	Disparity	2009
CA	California Department of Transportation	BBC Research & Consulting	Disparity	2007
CA	Los Angeles County Metropolitan Transportation Authority	BBC Research & Consulting	Disparity	2010
CA	Metrolink - Southern California Regional Rail Authority	BBC Research & Consulting	Disparity	2009
CA	Orange County Transportation Authority	BBC Research & Consulting	Disparity	2010
CA	San Diego Association of Governments	BBC Research & Consulting	Disparity	2010
CA	San Diego Metropolitan Transit System	BBC Research & Consulting	Disparity	2010
CA	San Mateo County Transit District	CRA International	Disparity	2008
CA	Santa Clara Valley Transportation Authority	CRA International	Disparity	2007
CO	City and County of Denver, Denver International Airport	NERA	Disparity	2006
CO	Colorado Department of Transportation	MGT of America, Inc.	Disparity	2001
CO	Colorado Department of Transportation	D. Wilson Consulting Group, LLC	Disparity	2009
CT	Metropolitan District Commission	M3C	Disparity	2009
DC	Washington Suburban Sanitary Commission	Mason Tillman Associates, Ltd.	Disparity	2011
FL	Broward County	MGT of America, Inc.	Disparity	2001

State	Subdivision	Author	Type of Study	Year Completed
FL	Broward County	NERA	Disparity	2010
FL	City of Tallahassee	MGT of America, Inc.	Disparity	2004
FL	Leon County	MGT of America, Inc.	Disparity	2009
FL	School District of Hillsborough County	Mason Tillman Associates, Ltd.	Disparity	2007
GA	City of Atlanta	Griffin & Strong	Disparity	2006
GA	Consolidated Government of Augusta-Richmond County	NERA	Disparity	2009
GA	Georgia Department of Transportation	Boston Research Group, Inc.	Disparity	2005
GA	Georgia Department of Transportation	BBC Research & Consulting	Disparity	2012
HI	Hawai'i Department of Transportation	NERA	Disparity	2010
ID	Idaho Transportation Department	BBC Research & Consulting	Disparity	2007
IL	Illinois Department of Transportation	Mason Tillman Associates, Ltd.	Disparity	2011
IL	Illinois State Toll Highway Authority	Mason Tillman Associates, Ltd.	Disparity	2011
IL	Illinois State Toll Highway Authority	NERA	Disparity	2006
IN	Indiana Department of Administration, Indiana DOT, Ball State Univ., Indiana State Univ., Indiana Univ., Ivy Tech Comm. College, Purdue Univ., Univ. of Southern Indiana, Vincennes Univ.	BBC Research & Consulting	Disparity	2010
KS	Kansas Department of Transportation	MGT of America, Inc.	Availability	2003
KS; MO	City of Kansas City; Wyandotte County, KS; Kansas City Area Transit Authority; Kansas City School District, MO	Mason Tillman Associates, Ltd.	Disparity	2006
MD	City of Baltimore	MGT of America, Inc.	Disparity	2000
MD	City of Baltimore	NERA	Disparity	2007
MD	State of Maryland	NERA	Disparity	2006
MD	State of Maryland	NERA	Disparity	2011
MA	City of Boston	Mason Tillman Associates, Ltd.	Disparity	2003
MA	Division of Capital Asset Management	NERA	Disparity	2006

State	Subdivision	Author	Type of Study	Year Completed
MA	Massachusetts Housing Finance Agency	NERA	Disparity	2006
MN	City of Minneapolis	NERA	Disparity	2010
MN	City of St. Paul and the St. Paul Housing Authority	MGT of America, Inc.	Disparity	2008
MN	Metropolitan Airports Commission	MGT of America, Inc.	Disparity	2009
MN	Metropolitan Council	MGT of America, Inc.	Disparity	2009
MN	Minnesota Department of Administration	MGT of America, Inc.	Disparity	2009
MN	Minnesota Department of Transportation	NERA	Availability	2005
MN	Minnesota Department of Transportation	MGT of America, Inc.	Disparity	2009
MO	Bi-State Development Agency (St. Louis Metro)	NERA	Disparity	2005
MO	City of St. Louis, The St. Louis Housing Authority, The Metropolitan St. Louis Sewer District	MGT of America, Inc.	Disparity	2001
MO	Missouri Department of Transportation	NERA	Disparity	2012
MT	Montana Department of Transportation	D. Wilson Consulting Group, LLC	Disparity	2009
NV	Nevada Department of Transportation	BBC Research & Consulting	Disparity	2007
NY	State of New York	NERA	Disparity	2010
NC	City of Charlotte	MGT of America, Inc.	Disparity	2011
NC	City of Durham and Durham County	Mason Tillman Associates, Ltd.	Disparity	2000
NC	Durham County	Griffin & Strong	Disparity	2007
NC	North Carolina Department of Transportation	MGT of America, Inc.	Disparity	2004
NC	North Carolina Department of Transportation	Euquant	Disparity	2009
OH	City of Cincinnati	Griffin & Strong	Disparity	2002
OH	City of Dayton	MGT of America, Inc.	Disparity	2008
OH	Northeast Ohio Regional Sewer District	NERA	Disparity	2010
OK	City of Tulsa	MGT of America, Inc.	Disparity	2010

State	Subdivision	Author	Type of Study	Year Completed
OK	Oklahoma Department of Transportation	BBC Research & Consulting	Disparity	2010
OR	City of Portland	BBC Research & Consulting	Disparity	2011
OR	Oregon Department of Transportation	MGT of America, Inc.	Disparity	2007
OR	Port of Portland	MGT of America, Inc.	Disparity	2009
OR	Portland Development Commission	BBC Research & Consulting	Disparity	2011
PA	City of Philadelphia	Econsult Corporation	Disparity	2007
PA	City of Philadelphia	Econsult Corporation	Disparity	2008
PA	City of Philadelphia	Econsult Corporation	Disparity	2009
PA	City of Philadelphia	Econsult Corporation	Disparity	2010
PA	City of Philadelphia	Econsult Corporation	Disparity	2011
PA	City of Philadelphia	Econsult Corporation	Disparity	2012
SC	City of Columbia	MGT of America, Inc.	Disparity	2006
TN	City of Memphis	Griffin & Strong	Disparity	2010
TN	Consolidated Government of Nashville and Davidson County	Griffin & Strong	Disparity	2004
TN	Memphis International Airport	NERA	Disparity	2008
TN	Nashville International Airport	Griffin & Strong	Disparity	2007
TX	City of Austin	NERA	Disparity	2008
TX	City of Fort Worth; City of Arlington; DFW Airport; Fort Worth Independent School District; Fort Worth Transportation Authority; North Texas Tollway Authority [North Central Texas Council of Governments]	Mason Tillman Associates, Ltd.	Disparity	2010
TX	City of Houston	NERA	Disparity	2012
TX	City of San Antonio, Alamo Regional Mobility Authority, Brooks Development Authority, CPS Energy, Edwards Aquifer Authority, Port Authority of San Antonio, San Antonio Housing Authority, San Antonio Water System, University Health System	MGT of America, Inc.	Disparity	2009
TX	Dallas Area Rapid Transit Authority (DART)	Mason Tillman Associates, Ltd.	Disparity	2003
TX	State of Texas	Mason Tillman Associates,	Disparity	2007

State	Subdivision	Author	Type of Study	Year Completed
		Ltd.		
TX	State of Texas	MGT of America, Inc.	Disparity	2010
UT	Salt Lake City International Airport	NERA	Disparity	2009
VA	Commonwealth of Virginia	MGT of America, Inc.	Disparity	2004
VA	Commonwealth of Virginia	MGT of America, Inc.	Disparity	2010
VA	Virginia DOT	MGT of America, Inc.	Disparity	2004
WA	Washington Department of Transportation	NERA	Availability	2005
WI	City of Milwaukee	Mason Tillman Associates, Ltd.	Disparity	2007
WI	City of Milwaukee	D. Wilson Consulting Group, LLC	Disparity	2010

Table 2. M/WBE Utilization, Availability, and Disparity: Selected Studies Performed in the U.S. Between 2000-2012.

State	Subdivision	U-CON	A-CON	D-CON	U-CRS	A-CRS	D-CRS	Years	Page Spec.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(11)
AK	Department of Transportation and Public Facilities	10.52	14.26	**73.73**				2002-2006	4-9, 4-11, 5-10, 5-13
AZ	Arizona Department of Transportation	7.03	15.61	**45.03**	5.39	27.07	**19.90**	2002-2007	4-47
AZ	City of Phoenix	11.37	21.48	**52.94**				2000-2004	4-29, 4-33
AZ	City of Tucson	24.55	5.76	426.21				2002-2006	4-9, 4-10, 5-10, 5-19
AZ	Pima County	19.51	9.43	206.83	19.25	25.10	**76.71**	2002-2006	4-9, 4-10, 5-13, 5-16, 5-28, 5-32
CA	Bay Area Rapid Transit (BART)	19.34	34.42	**56.20**				2002-2007	4-8, 5-5, 7-20
CA	California Department of Transportation (federal funds)	14.34	17.00	***84.36***	18.90	25.50	**74.11**	2002-2006	Figs. E-26, 29
CA	California Department of Transportation (state funds)	11.41	18.70	**61.00**	12.04	28.20	**42.68**	2002-2006	Figs. E-69, 70
CA	Los Angeles County Metropolitan Transportation Authority (federal funds)	15.01	13.70	109.54	14.44	29.65	**48.69**	2003-2007	E-42, E-20, E-21
CA	Los Angeles County Metropolitan Transportation Authority (local funds)	12.20	20.80	**58.65**	17.81	28.80	**61.84**	2003-2007	E-13, E-22
CA	Metrolink - Southern California Regional Rail Authority (federal funds)	10.71	16.00	**66.97**	62.54	24.58	254.40	2003-2007	E-42, E-20, E-21
CA	Metrolink - Southern California Regional Rail Authority (local funds)	8.60	30.00	**28.65**	24.73	40.40	**61.22**	2003-2007	E-13, E-22
CA	Orange County Transportation Authority (federal funds)	36.77	26.70	137.70	13.42	23.77	**56.47**	2003-2007	E-42, E-20, E-21
CA	Orange County Transportation Authority (local funds)	52.24	30.00	174.13	24.97	31.90	**78.27**	2003-2007	E-13, E-22

State	Subdivision	U-CON	A-CON	D-CON	U-CRS	A-CRS	D-CRS	Years	Page Spec.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(11)
CA	San Diego Association of Governments (federal funds)	8.49	23.60	**35.97**	27.59	23.54	117.22	2003-2007	E-42, E-20, E-21
CA	San Diego Association of Governments (local funds)	0.45	22.50	**1.99**	18.20	27.70	**65.69**	2003-2007	E-13, E-22
CA	San Diego Metropolitan Transit System (federal funds)	27.66	33.20	***83.30***	19.75	26.56	**74.37**	2003-2007	E-42, E-20, E-21
CA	San Diego Metropolitan Transit System (local funds)	26.75	36.90	**72.49**	0.00	32.90	**0.00**	2003-2007	E-13, E-22
CA	San Mateo County Transit District	5.56	21.40	**26.00**				2002	26, 104
CA	Santa Clara Valley Transportation Authority	17.10	21.40	**79.88**				2001-2006	28, 104, 112
CO	City and County of Denver, Denver International Airport	12.86	21.92	**58.67**	25.41	14.97	169.74	2000-2005	190
CO	Colorado Department of Transportation	10.56	20.21	**52.25**	4.69	24.07	**19.48**	1996-2000	3-20
CO	Colorado Department of Transportation	16.58	23.17	**71.58**	21.21	41.37	**51.28**	2002-2007	4-5, 4-6, 4-7, 5-8, 5-10, 6-6, 6-7
CT	Metropolitan District Commission	30.68	19.66	156.07	8.35	18.70	**44.64**	2005-2008	V-112, V-114, V-116, V-117, V-119, V-121, V-123, V-125
DC	Washington Suburban Sanitary Commission	29.57	68.38	**43.24**	31.49	61.12	**51.52**	2003-2009	1-15, 1-17, 2-5, 2-7, 4-21, 4-23, 4-36, 4-38
FL	Broward County	35.70	40.57	***87.99***	16.04	44.95	**35.68**	1991-1999	4-18, 4-21, 4-28, 4-31, 4-33, 4-37
FL	Broward County	28.62	24.10	118.76	26.86	25.87	103.83	2005-2009	284
FL	City of Tallahassee	28.50	34.03	***83.74***				1996-2000	4-13, 4-17, 4-19

State	Subdivision	U-CON	A-CON	D-CON	U-CRS	A-CRS	D-CRS	Years	Page Spec.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(11)
FL	Leon County	19.56	11.92	164.04				2004-2008	4-10, 4-12, 4-13
FL	School District of Hillsborough County	30.49	37.58	***81.12***	24.69	42.99	**57.45**	2001-2004	2-5, 2-7, 3-4, 3-6, 5-21, 5-23, 5-32, 5-34
GA	City of Atlanta	34.02	57.63	**59.04**	35.03	56.30	**62.21**	2001-2005	Vol. I, 19, 21, 22, 30, 46, 59, 62
GA	City of Atlanta (Airport, local dollars)	59.17	57.63	102.66				2001-2005	Vol. I, 19, 70, 73, 80
GA	City of Atlanta (Airport, federal dollars)	26.30	57.63	**45.63**				2001-2005	Vol. I, 19, 83, 86
GA	City of Atlanta (Watershed Management)	23.72	57.63	**41.16**				2001-2005	Vol. I, 19, 21, 22, 88, 91, 95
GA	Consolidated Government of Augusta-Richmond County	5.91	32.37	**18.26**	28.65	44.93	**63.77**	2003-2007	225
GA	Georgia Department of Transportation	8.46	11.03	**76.67**				1999-2004	111, 119, 123, 130
GA	Georgia Department of Transportation (federal dollars)	13.23	21.50	**61.52**	9.31	24.40	**38.17**	2009-2011	K-6, K-9
GA	Georgia Department of Transportation (state dollars)	4.81	25.50	**18.87**	12.26	26.50	**46.27**	2009-2011	K-7, K-10
HI	Hawai'i Department of Transportation	32.17	54.78	**58.70**	62.01	51.79	119.73	2003-2008	331
ID	Idaho Transportation Department	14.36	16.90	***84.95***	6.79	12.90	**52.63**	2002-2006	Figs. E-11, 20
IL	Illinois Department of Transportation	11.00	27.33	**40.25**	21.22	29.82	**71.18**	2006-2008	4-10, 4-11, 5-3, 5-4, 7-18, 7-19, 7-21, 7-22

State	Subdivision	U-CON	A-CON	D-CON	U-CRS	A-CRS	D-CRS	Years	Page Spec.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(11)
IL	Illinois State Toll Highway Authority	11.43	19.56	**58.44**	23.58	19.03	123.91	2000-2005	49, 50, 61, 63
IL	Illinois State Toll Highway Authority	11.38	39.39	**28.89**	16.42	41.02	**40.04**	2006-2009	4-8, 4-10, 5-4, 5-6, 7-15, 7-17, 7-20, 7-22
IN	State of Indiana (INDOT and INDOA)	10.03	10.90	***92.03***				2006-2009	O-2
IN	State of Indiana (Higher Educ.)	10.69	15.10	**70.79**				2006-2009	M-2
KS; MO	City of Kansas City, KS	18.34	25.31	**72.44**	15.34	36.21	**42.37**	2002-2004	3-5, 3-7, 4-4, 4-6, 6-21, 6-23, 6-30, 6-32
KS; MO	Kansas City School District, MO	34.20	25.60	133.58				2002-2004	3-5, 4-4, 6-21, 6-28
KS	Kansas Department of Transportation	10.31	13.75	**75.01**				2000-2001	2-10, 2-12, 3-2, 3-3
MD	City of Baltimore	23.02	36.63	**62.84**	30.14	21.60	139.51	1990-1998	4-20, 4-26, 4-29, 4-31, 4-33, 4-34
MD	City of Baltimore	25.85	22.88	112.98	31.88	27.32	116.69	2000-2005	217
MD	State of Maryland	15.81	24.00	**65.88**	24.52	28.46	***86.16***	2000-2004	206
MD	State of Maryland	23.45	30.26	**77.51**	22.31	41.34	**53.97**	2005-2009	328
MA	City of Boston	23.76	24.23	***98.08***	10.26	47.02	**21.83**	1999-2001	1-5, 1-7, 2-4, 2-6, 4-22, 4-24, 4-29, 4-31
MA	Division of Capital Asset Management	19.44	10.39	187.10	33.79	17.86	189.19	1999-2004	199
MA	Massachusetts Housing Finance Agency	25.80	10.86	237.57				2000-2004	203

State	Subdivision	U-CON	A-CON	D-CON	U-CRS	A-CRS	D-CRS	Years	Page Spec.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(11)
MN	City of Minneapolis	7.57	19.54	**38.73**	13.65	19.08	**71.51**	2003-2007	234
MN	City of St. Paul	15.23	15.05	101.17				2002-2006	4-21, 4-22, 4-28, 4-29
MN	St. Paul Housing Authority	6.33	10.43	**60.67**				2002-2006	6-6, 6-12, 6-18
MN	Metropolitan Airports Commission	2.05	11.28	**18.21**				2004-2007	3-8, 3-10, 3-12, 3-13
MN	Metropolitan Council	0.16	3.63	**4.41**				2003-2007	3-8, 3-10, 3-13
MN	Minnesota Department of Administration	3.42	2.74	124.97				2002-2007	3-8, 3-10, 3-14
MN	Minnesota Department of Transportation (federal funds)	5.55	15.18	**36.56**				2000-2004	69, 72
MN	Minnesota Department of Transportation (state funds)	2.92	15.18	**19.24**				2000-2004	69, 75
MN	Minnesota Department of Transportation	2.40	3.52	**68.06**				2002-2007	3-7, 3-9, 3-12
MO	Bi-State Development Agency (St. Louis Metro)	21.16	20.14	105.06	18.98	15.29	124.13	1997-2003	167
MO	City of St. Louis	19.06	15.89	119.97	17.44	27.46	**63.52**	1995-1999	Ex. pp. 2, 4, 7, 9, 11, 12
MO	The Metropolitan St. Louis Sewer District	13.91	15.89	***87.54***	15.42	27.46	**56.16**	1995-1999	Ex. pp. 84, 86, 89, 91, 93, 94
MO	Missouri Department of Transportation (federal funds)	13.35	20.37	**65.56**	13.05	21.52	**60.66**	2005-2009	220
MO	Missouri Department of Transportation (state funds)	6.49	20.19	**32.16**	12.28	21.48	**57.16**	2005-2009	224
MT	Montana Department of Transportation	11.32	2.01	563.36	11.68	16.09	**72.58**	2000-2006	4-6, 4-8, 5-18, 5-29, 5-53, 5-64
NV	Nevada Department of Transportation (federal funds)	8.70	15.60	**55.79**	3.03	7.80	**38.89**	2000-2006	Figs. E-11, 20
NV	Nevada Department of Transportation (state funds)	8.34	12.90	**64.65**	3.05	10.80	**28.26**	2000-2006	Figs. E-38, 47

State	Subdivision	U-CON	A-CON	D-CON	U-CRS	A-CRS	D-CRS	Years	Page Spec.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(11)
NY	State of New York	12.39	22.74	**54.48**	19.43	24.53	**79.21**	2004-2008	292
NC	City of Charlotte	19.28	35.74	**53.95**	13.66	18.55	**73.66**	2005-2010	3-11, 3-13, 3-15, 3-16, 3-19, 3-20, 3-23
NC	City of Durham and Durham County	12.79	27.38	**46.72**				1996-1999	3-4, 3-6, 5-9, 5-11
NC	Durham County	6.24	72.85	**8.57**	20.23	27.30	**74.13**	2001-2005	76, 78, 82, 85, 94, 118
NC	North Carolina Department of Transportation (divisionally-let)	13.41	12.70	105.59				1999-2003	4-16, 4-26, 4-49, 4-72, 4-90
NC	North Carolina Department of Transportation (centrally-let, state funds)	9.83	29.92	**32.87**	14.41	20.00	**72.06**	1999-2003	4-52, 4-56, 4-70, 4-76, 4-80, 4-90
NC	North Carolina Department of Transportation (centrally-let, federal funds)	11.43	29.92	**38.22**	4.86	20.00	**24.30**	1999-2003	4-62, 4-66, 4-70, 4-84, 4-88, 4-90
NC	North Carolina Department of Transportation	8.65	24.98	**34.62**				2004-2008	89, 90, 138
OH	City of Cincinnati	16.41	18.33	***89.51***	12.20	22.48	**54.28**	1995-2001	44, 45, 49, 50
OH	City of Dayton	4.73	23.91	**19.80**				2001-2006	4-11, 4-17, 4-19, 4-20, 4-24
OH	Northeast Ohio Regional Sewer District	24.44	22.31	109.55	23.78	22.03	107.94	2004-2008	263
OK	City of Tulsa	4.72	20.77	**22.73**	24.70	22.51	109.71	2002-2008	4-8, 4-13, 4-14, 4-15, 4-20, 4-22, 4-23
OK	Oklahoma Department of Transportation (federal funds)	19.47	12.40	156.99	3.96	19.10	**20.73**	2004-2009	K-6, K-9

State	Subdivision	U-CON	A-CON	D-CON	U-CRS	A-CRS	D-CRS	Years	Page Spec.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(11)
OK	Oklahoma Department of Transportation (state funds)	19.82	15.40	128.70	5.00	19.90	**25.13**	2004-2009	K-7, K-10
OR	City of Portland	7.49	5.10	146.85	34.98	14.60	239.62	2004-2009	L-5, M-2
OR	Oregon Department of Transportation	19.07	27.55	**69.20**	3.84	46.31	**8.30**	2000-2007	4-12, 4-21, 4-25, 4-111, 4-120, 4-123, 4-124
OR	Port of Portland	18.59	15.16	122.66	9.94	27.97	**35.53**	2002-2007	4-11, 4-13, 4-15, 4-19
OR	Portland Development Commission	9.29	12.37	**75.06**				2004-2009	L-2, L-5
PA	City of Philadelphia	12.90	10.80	119.44				2006	17, 21
PA	City of Philadelphia	13.80	10.80	127.78				2007	36, 51
PA	City of Philadelphia	12.70	10.80	117.59				2008	vi, 45
PA	City of Philadelphia	9.30	10.80	86.11				2009	viii, 41
PA	City of Philadelphia	17.40	14.90	116.78				2010	vi, vii
PA	City of Philadelphia	13.30	11.40	116.67				2011	v, vii
SC	City of Columbia	3.42	19.03	**17.96**	18.15	17.14	105.90	2002-2005	4-10, 4-15, 4-16, 4-17, 4-24, 4-26
TN	City of Memphis	18.77	18.84	***99.62***				2002-2007	112, 116, 129
TN	Consolidated Government of Nashville and Davidson County (Metro Purchasing)	0.37	6.25	**5.90**	0.04	2.39	**1.63**	1999-2003	57, 65, 66, 68, 69
TN	Consolidated Government of Nashville and Davidson County (Nashville Public Schools)	0.02	4.27	**0.40**	3.30	7.24	**45.58**	1999-2003	58, 98, 99, 100, 102
TN	Consolidated Government of Nashville and Davidson County (Metro Nashville Airport)	12.70	12.70	***100.00***	0.20	7.97	**2.50**	1999-2003	60, 76, 77, 79
TN	Consolidated Government of Nashville and Davidson County (Metro Development and Housing Authority)	20.70	16.56	125.03	29.33	10.41	281.71	1999-2003	61, 85, 86, 88, 89

State	Subdivision	U-CON	A-CON	D-CON	U-CRS	A-CRS	D-CRS	Years	Page Spec.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(11)
TN	Memphis International Airport	18.69	27.99	**66.77**	13.88	34.32	**40.44**	1999-2005	229
TN	Nashville International Airport	9.81	9.68	101.37	7.53	8.87	***84.84***	2003-2006	36, 38, 39, 40, 47, 49
TX	City of Austin	29.83	27.54	108.32	39.39	31.79	123.91	2002-2006	206
TX	City of Arlington	10.94	66.58	**16.43**	13.11	54.03	**24.27**	2002-2007	2-9, 2-11, 3-5, 3-7, 3-9, 5-24, 5-26, 5-33, 5-35, 5-37
TX	City of Fort Worth	38.41	60.28	**63.72**	60.81	54.05	112.51	2002-2007	2-9, 2-11, 3-5, 3-7, 5-26, 5-28, 5-37, 5-39
TX	DFW Airport	50.72	62.82	***80.74***	57.53	53.80	106.93	2002-2007	2-9, 2-11, 3-5, 3-7, 5-26, 5-28, 5-37, 5-39
TX	Fort Worth Independent School District	27.75	66.06	**42.01**	28.91	53.89	**53.64**	2002-2007	2-9, 2-11, 3-4, 3-6, 5-26, 5-28, 5-37, 5-39
TX	North Texas Tollway Authority	18.60	58.34	**31.88**	14.75	53.56	**27.54**	2003-2007	2-9, 2-11, 3-4, 3-6, 5-26, 5-28, 5-37, 5-39
TX	City of Houston	29.87	34.74	***85.97***				2005-2010	191
TX	City of San Antonio	35.19	28.14	125.09				2004-2007	3-9, 3-15, 3-16, 3-17

State	Subdivision	U-CON	A-CON	D-CON	U-CRS	A-CRS	D-CRS	Years	Page Spec.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(11)
TX	Dallas Area Rapid Transit Authority (DART)	31.44	68.38	**45.98**				1996-2001	3-5, 4-5, 4-7, 6-22, 6-29, 6-31
TX	State of Texas	13.71	51.57	**26.58**	18.27	55.74	**32.79**	2002-2005	3-8, 3-10, 4-6, 4-12, 6-21, 6-23, 6-37, 6-39
TX	State of Texas (TxDOT)	7.07	10.14	**69.67**				2006-2008	4-10, 4-19, 5-11
TX	State of Texas (State Agencies)	24.04	22.10	108.78				2006-2008	4-10, 4-20, 4-21, 5-11
TX	State of Texas (Universities)	21.66	22.10	***98.01***				2006-2008	4-10, 4-20, 4-21, 5-11
TX	State of Texas (Medical Institutions)	21.95	22.10	***99.29***				2006-2008	4-10, 4-20, 4-21, 5-11
UT	Salt Lake City International Airport	5.32	17.03	**31.24**	0.79	18.25	**4.33**	2001-2006	258
VA	Commonwealth of Virginia	3.39	15.55	**21.78**				2006-2009	4-10, 4-12, 4-20, 4-26,
VA	Commonwealth of Virginia	1.35	14.66	**9.19**				1998-2002	4-16, 4-23, 4-27, 4-32
VA	Virginia DOT (federal funds)	6.59	10.26	**64.21**	9.53	15.89	**59.99**	1998-2002	11, 15, 18, 22, 26, 29
VA	Virginia DOT (state funds)	8.52	10.26	***82.99***	5.41	15.89	**34.08**	1998-2002	34, 38, 41, 45, 49, 52
WA	Washington Department of Transportation (federal funds)	14.32	19.59	**73.10**	10.44	14.88	**70.16**	1999-2003	63, 66, 72
WA	Washington Department of Transportation (state funds)	2.97	19.59	**15.16**	10.66	14.88	**71.64**	1999-2003	63, 69, 75
WI	City of Milwaukee	18.94	40.91	**46.29**				2005	5-11, 6-5, 6-26

State	Subdivision	U-CON	A-CON	D-CON	U-CRS	A-CRS	D-CRS	Years	Page Spec.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(11)
WI	City of Milwaukee	31.21	13.77	226.74				2005-2008	4-7, 4-9, 5-2, 5-7

Note: Disparity indexes of 80 or lower are highlighted in **boldface** type. Disparity indexes above 80 but lower than 100 are highlighted in ***boldface italic*** type.

C. There is Strong Evidence of Disparities Between Utilization and Availability in Aggregate U.S. Business Enterprise Activity

A key rationale for the advent of public sector policies such as the USDOT DBE Program was the federal government's desire to prevent its own passive participation in private sector discrimination in business enterprise activity.[23] Therefore, it is important to examine the best available evidence regarding how minorities and women fare in the economy as a whole with respect to business enterprise activity. In order to do this, I present evidence from the U.S. Census Bureau's past and present data collection efforts dedicated to M/WBEs.

The *Survey of Business Owners and Self-Employed Persons* (SBO) collected data on the number, sales, employment, and payrolls of businesses owned by minorities, women, and non-minority males. This survey was conducted every five years from 1972 to 2012 as part of the *Economic Census* program. Data from the 2012 SBO, the most recent available, were released in December 2015. In mid-2018, the Census Bureau announced that the SBO would be discontinued and only partially replaced with a new survey called the *Annual Business Survey* (ABS).[24] Unfortunately, the ABS is restricted to firms with paid employees only, as opposed to the SBO that also included nonemployer firms.[25] Data from the 2017 ABS, the most recent available, were released in May 2020.[26] The SBO and ABS cover women and five groups of minorities: (1) African Americans, (2) Hispanics, (3) Asians, (4) Native Hawaiians and Other Pacific Islanders, and (5) American Indians and Alaskan Natives. Comparative information for non-minority male-owned firms is also included.[27]

The SBO and ABS contain a wealth of information on the character of minority and female business enterprise in the U.S as a whole as well as in individual states and sub-state divisions.[28] In the remainder of this section, I present national evidence from the 2012 SBO and the 2017 ABS for the economy as whole, as well as for the construction and architecture/engineering industries that are the main beneficiaries of federal surface and aviation transportation funding.

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[23] *City of Richmond v. J. A. Croson Company*, 488 U.S. 469, at 492 ("Thus, if the city could show that it had essentially become a 'passive participant' in a system of racial exclusion practiced by elements of the local construction industry, we think it clear that the city could take affirmative steps to dismantle such a system.").

[24] U.S. Census Bureau (2018e).

[25] U.S. Census Bureau (2018f). In 2012, according to the SBO, there were about 5.1 million firms with paid employees and more than 22 million nonemployer firms.

[26] U.S. Census Bureau (2020c).

[27] In the American Community Survey Public Use Microdata Samples (ACS PUMS), discussed below, the unit of analysis is the business owner, or self-employed person. In the SBO and ABS data, the unit of analysis is the business itself rather than the business owner. Furthermore, unlike most other business statistics, including the other components of the *Economic Census*, the unit of analysis in the SBO and ABS is the firm, rather than the establishment.

[28] Appendix A, below, provides state-level data from the 2017 ABS. Appendices B, C and D, below, provide state-level data from the 2012, 2007 and 2002 SBO.

1. Results from the 2012 Survey of Business Owners

a. Economy-Wide Results

I begin with the 2012 SBO—the most recent and last data from this important survey. Table 3 contains data for the U.S. as a whole and the economy-wide (*i.e.* all industries combined). Panel A in this table summarizes the SBO results for each race and/or sex grouping. For example, Panel A shows a total of 27.18 million firms in the U.S. in 2012 (column 1) with overall sales and receipts of $11.964 trillion (column 2). Of these 27.18 million firms, 5.14 million had one or more employees (column 3) and these 5.14 million firms had overall sales and receipts of $10.965 trillion (column 4). Column (5) shows a total of 56.059 million employees on the payroll of these 5.14 million firms and a total annual payroll expense of $2.096 trillion (column 6).

The remaining rows in Panel A provide comparable statistics for nonminority male-owned, women-owned, and minority-owned firms. For example, Table 3 shows that there were 2.6 million African American-owned firms counted in the SBO, and that these 2.6 million firms registered $150.2 billion in sales and receipts. It also shows that 109,137 of these African American-owned firms had one or more employees, and that they employed a total of 975,052 workers with an annual payroll total of $27.69 billion.

Panel B in Table 3 converts the figures in Panel A to percentage distributions within each column. For example, Column (1) in Panel B of Table 3 shows that African American-owned firms were 9.51 percent of all firms in the U.S. and women-owned firms were 36.35 percent. Additionally, 12.16 percent of firms were Hispanic-owned, 7.06 percent were Asian-owned, 1.0 percent were American Indian- and Alaska Native-owned, and 0.20 percent were Native Hawaiian- and Other Pacific Islander-owned.

Column (2) in Panel B provides the same percentage distribution for overall sales and receipts. Table 3, for example, shows that nonminority males owned 45.18 percent of all firms and earned 73.45 percent of all sales and receipts. In contrast:

- Although African Americans owned 9.51 percent of all firms in the U.S. in 2012, they earned only 1.26 percent of all sales and receipts.

- Although Hispanics owned 12.16 percent of all firms, they earned only 3.96 percent, of all sales and receipts.

- Although Asians owned 7.06 percent of all firms, they earned only 5.85 percent, of all sales and receipts.

- Although American Indians and Alaska Natives owned 1.0 percent of all firms, they earned only 0.32 percent of all sales and receipts.

- Although Native Hawaiians and Other Pacific Islanders owned 0.20 percent of all firms, they earned only 0.07 percent of all sales and receipts.

- Although women owned firms 36.35 percent of all firms, they earned only 11.87 percent of all sales and receipts.

These disparities between the availability and utilization of minority- and women-owned firms can be viewed directly from the disparity indexes in Panel C of Table 3. For example, Panel C shows that African American-owned firms in 2012 received just 13.2 percent of what would be expected based on their availability in the market. Panel C shows as well that women-owned firms received just 32.65 percent of what would be expected based on their availability in the market. For Hispanics, the figure was 32.55 percent. For Asians, the figure was 82.85 percent. For American Indians and Alaska Natives, the figure was 32.33 percent, and for Native Hawaiians and Other Pacific Islanders, the figure was 33.76 percent. These disparities are all adverse, and statistically significant. The disparities are all large as well, with the exception of Asian-owned firms.

We can also compare sales and receipts per firm among all firms in 2012. In Table 3, for example, average per firm sales and receipts for non-minority male-owned firms was $715.6 thousand. In contrast:

- For African American-owned employer firms, average per firm sales and receipts was $58.1 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, African American-owned firms received just 8 cents.

- For Hispanic-owned firms, average per firm sales and receipts was $143.3 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Hispanic-owned firms received just 20 cents.

- For Asian-owned firms, average per firm sales and receipts was $364.7 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Asian-owned firms received just 51 cents.

- For American Indian- and Alaska Native-owned firms, average per firm sales and receipts was $142.3 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, American Indian- and Alaska Native-owned firms received just 20 cents.

- For Native Hawaiian- and Other Pacific Islander-owned firms, average per firm sales and receipts was $148.6 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Native Hawaiian- and Other Pacific Islander-owned firms received just 21 cents.

- For women-owned firms, average per firm sales and receipts was $143.7 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, women-owned firms received just 20 cents.

Turning to employer firms, we see from column (3) in Table 3, that although nonminority male-owned firms were 57.11 percent of all employer firms, they accounted for 74.98 percent of all employer firm sales and receipts. In contrast:

- Although African Americans owned 2.12 percent of all employer firms in the U.S. in 2012, they earned only 0.94 percent of all sales and receipts.

- Although Hispanics firms 5.6 percent of all employer firms, they earned only 3.47 percent of all sales and receipts.

- Although Asians owned 9.37 percent of all employer firms, they earned only 5.72 percent of all sales and receipts.

- Although American Indians and Alaska Natives owned 0.51 percent of all employer firms, they earned only 0.29 percent of all sales and receipts.

- Although Native Hawaiians and Other Pacific Islanders owned 0.09 percent of all employer firms, they earned only 0.06 percent of all sales and receipts.

- Although women owned 20.16 percent of all employer firms, they earned only 10.86 percent of all sales and receipts.

The economy-wide employer firm disparity indexes for 2012 appear in Panel C of Table 3. Panel C shows that African American-owned firms in 2012 received just 44.4 percent of what would be expected based on their availability in the market. Women-owned firms received just 53.85 percent of what would be expected based on their availability in the market. For Hispanics, the figure was 61.91 percent. For Asians, the figure was 61.11 percent. For American Indians and Alaska Natives, the figure was 56.64 percent, and for Native Hawaiians and Other Pacific Islanders, the figure was 64.40 percent. These disparities are all large, adverse, and statistically significant.

Considering sales and receipts among employer firms in 2012. Table 3 shows a figure of $2.8 million for non-minority male-owned employer firms. In contrast:

- For African American-owned employer firms, average per firm sales and receipts was $947.9 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, African American-owned firms received just 34 cents.

- For Hispanic-owned firms, average per firm sales and receipts was $1.32 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Hispanic-owned firms received just 47 cents.

- For Asian-owned firms, average per firm sales and receipts was $1.3 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Asian-owned firms received just 47 cents.

- For American Indian- and Alaska Native-owned firms, average per firm sales and receipts was $1.21 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, American Indian- and Alaska Native-owned firms received just 43 cents.

- For Native Hawaiian- and Other Pacific Islander-owned firms, average per firm sales and receipts was $1.37 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Native Hawaiian- and Other Pacific Islander-owned firms received just 49 cents.

- For women-owned firms, average per firm sales and receipts was $1.15 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, women-owned firms received just 41 cents.

The problem of minority- and women-owned firms earning less has important consequences that ripple throughout the economy. Because these firms make less, they have to pay their employees less. This obviously compounds race and gender disparities to the extent that minority- and women-owned firms hire proportionately more minority and female employees. In addition, it reduces the wealth accruing to minorities and women and thus hinders any would-be minority and women entrepreneurs in their efforts to create and grow their own firms thus reinforcing the negative consequences of social and economic disadvantage. Table 3 shows that average payroll per employee at non-minority male-owned employer firms in 2012 was $40,573. In contrast:

- For African American-owned employers, average payroll per employee was just $28,398. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at African American-owned firms earned only 70 cents.

- For Hispanic-owned employers average payroll per employee was just $30,416. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Hispanic-owned firms earned only 75 cents.

- For Asian-owned employers average payroll per employee was just $30,942. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Asian-owned firms earned only 76 cents.

- For American Indian- and Alaska Native-owned employers average payroll per employee was just $33,599. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at American Indian- and Alaska Native-owned firms earned just 83 cents.

- For Native Hawaiian- and Other Pacific Islander-owned employers, average payroll per employee was just $36,681. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Native Hawaiian- and Other Pacific Islander-owned firms earned just 90 cents.

- For women-owned employers average payroll per employee was just $31,278. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at women-owned firms earned only 77 cents.

Table 3. Disparity Ratios from the 2012 Survey of Business Owners, United States, All Industries

	Number of Firms	Sales and Receipts ($000s)	Employer Firms	Sales and Receipts ($000s)	Employees	Payroll ($000s)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Levels						
All Firms	27,179,380	11,964,077,871	5,136,203	10,964,584,749	56,058,563	2,096,442,212
Non-minority male	12,280,591	8,787,915,377	2,933,198	8,221,010,815	37,750,711	1,531,662,394
African American	2,584,403	150,203,163	109,137	103,451,510	975,052	27,689,957
Hispanic	3,305,873	473,635,944	287,501	379,994,999	2,329,553	70,855,704
Asian	1,917,902	699,492,422	481,026	627,532,399	3,572,577	110,543,615
Native Hawaiian/Pac. Islander	54,749	8,136,445	4,706	6,469,957	39,001	1,430,591
Am. Indian & Alaska Native	272,919	38,838,125	26,179	31,654,165	208,178	6,994,509
Female	9,878,397	1,419,834,295	1,035,655	1,190,586,438	8,431,614	263,720,252
Panel B. Column Percentages						
All Firms	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Non-minority male	45.18%	73.45%	57.11%	74.98%	67.34%	73.06%
African American	9.51%	1.26%	2.12%	0.94%	1.74%	1.32%
Hispanic	12.16%	3.96%	5.60%	3.47%	4.16%	3.38%
Asian	7.06%	5.85%	9.37%	5.72%	6.37%	5.27%
Native Hawaiian/Pac. Islander	0.20%	0.07%	0.09%	0.06%	0.07%	0.07%
Am. Indian & Alaska Native	1.00%	0.32%	0.51%	0.29%	0.37%	0.33%
Female	36.35%	11.87%	20.16%	10.86%	15.04%	12.58%
Panel C. Disparity Ratios		(2) vs. (1)		(4) vs. (3)	(5) vs. (3)	(6) vs. (3)
Non-minority male		*162.56*		*131.29*	*117.92*	*127.93*
African American		*13.20*		*44.40*	*81.86*	*62.16*
Hispanic		*32.55*		*61.91*	*74.24*	*60.38*
Asian		*82.85*		*61.11*	*68.05*	*56.30*
Native Hawaiian/Pac. Islander		*33.76*		*64.40*	*75.93*	*74.48*
Am. Indian & Alaska Native		*32.33*		*56.64*	*72.86*	*65.46*
Female		*32.65*		*53.85*	*74.59*	*62.39*

Source: Author's calculations using 2012 SBO. Notes: (1) Figures are rounded. Rounding was performed subsequent to any mathematical calculations; (2) Excludes publicly owned, foreign-owned, and not-for-profit firms; (3) Totals for "All Firms" includes firms that were equally nonminority-minority owned; (4) Statistically significant disparity indexes are italicized; (5) "n/a" indicates that data were not disclosed due to confidentiality or other publication restrictions.

b. Results for the Construction Sector

Table 4 shows comparable 2012 SBO data for the construction sector in the U.S. as a whole.

Column (2) in Panel B of Table 4 shows that nonminority males owned 62.85 percent of all firms and earned 78.02 percent of all sales and receipts. In contrast:

- Although African Americans owned 4.67 percent of all firms in the U.S. in 2012, they earned only 0.93 percent of all sales and receipts.

- Although Hispanics owned 16.24 percent of all firms, they earned only 4.65 percent, of all sales and receipts.

- Although Asians owned 2.63 percent of all firms, they earned only 1.28 percent, of all sales and receipts.

- Although American Indians and Alaska Natives owned 1.23 percent of all firms, they earned only 0.62 percent of all sales and receipts.

- Although Native Hawaiians and Other Pacific Islanders owned 0.19 percent of all firms, they earned only 0.13 percent of all sales and receipts.

- Although women owned firms 9.08 percent of all firms, they earned only 7.75 percent of all sales and receipts.

The associated 2012 disparity indexes for firms in the construction sector can be viewed directly in Panel C of Table 4. Panel C shows that African American-owned firms in 2012 received just 19.88 percent of what would be expected based on their availability in the market. Panel C shows as well that women-owned firms received 85.37 percent of what would be expected based on their availability in the market. For Hispanics, the figure was 28.64 percent. For Asians, the figure was 48.74 percent. For American Indians and Alaska Natives, the figure was 50.19 percent, and for Native Hawaiians and Other Pacific Islanders, the figure was 66.26 percent. These disparities are all adverse, and statistically significant. The disparities are all large as well, with the exception of women-owned firms.

We can also compare sales and receipts per firm among all firms in construction in 2012. In Table 4 average per firm sales and receipts for non-minority male-owned firms was $508.9 thousand. In contrast:

- For African American-owned employer firms, average per firm sales and receipts was $81.5 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, African American-owned firms received just 16 cents.

- For Hispanic-owned firms, average per firm sales and receipts was $117.4 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Hispanic-owned firms received just 23 cents.

- For Asian-owned firms, average per firm sales and receipts was $199.8 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Asian-owned firms received just 39 cents.

- For American Indian- and Alaska Native-owned firms, average per firm sales and receipts was $205.8 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, American Indian- and Alaska Native-owned firms received just 40 cents.

- For Native Hawaiian- and Other Pacific Islander-owned firms, average per firm sales and receipts was $271.7 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Native Hawaiian- and Other Pacific Islander-owned firms received just 53 cents.

- For women-owned firms, average per firm sales and receipts was $350 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, women-owned firms received just 69 cents.

Turning to employer firms, we see from column (3) in Table 4, that although nonminority male-owned firms were 69.87 percent of all employer firms, they accounted for 79.09 percent of all employer firm sales and receipts. In contrast:

- Although African Americans owned 1.19 percent of all employer firms in the U.S. in 2017, they earned only 0.77 percent of all sales and receipts.

- Although Hispanics firms 6.07 percent of all employer firms, they earned only 3.59 percent of all sales and receipts.

- Although Asians owned 1.66 percent of all employer firms, they earned only 1.19 percent of all sales and receipts.

- Although American Indians and Alaska Natives owned 0.76 percent of all employer firms, they earned only 0.57percent of all sales and receipts.

- Native Hawaiians and Other Pacific Islanders owned 0.11 percent of all employer firms, and they earned 0.12 percent of all sales and receipts, essentially at parity.

- Although women owned 8.55 percent of all employer firms, they earned only 7.86 percent of all sales and receipts.

The employer firm disparity indexes for construction in 42012 appear in Panel C of Table 4. Panel C shows that African American-owned firms in 2012 received just 64.51 percent of what would be expected based on their availability in the market. Women-owned firms received just 91.88 percent of what would be expected based on their availability in the market. For Hispanics, the figure was 59.14 percent. For Asians, the figure was 71.94 percent. For American Indians and Alaska Natives, the figure was 74.52 percent, and for Native Hawaiians and Other Pacific

Islanders, the figure was 101.89 percent. The disparities for African Americans, Hispanics, Asians and American Indians and Alaska Natives are all large, adverse, and statistically significant. The disparity for women is adverse, and statistically significant. The disparity for Native Hawaiians and Other Pacific Islanders is not statistically significant.

Considering sales and receipts among employer firms in 2012, Table 4 shows a figure of $1.92 million for non-minority male-owned employer firms. In contrast:

- For African American-owned employer firms, average per firm sales and receipts was $1.1 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, African American-owned firms received just 57 cents.

- For Hispanic-owned firms, average per firm sales and receipts was $1.01 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Hispanic-owned firms received just 52 cents.

- For Asian-owned firms, average per firm sales and receipts was $1.22 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Asian-owned firms received just 64 cents.

- For American Indian- and Alaska Native-owned firms, average per firm sales and receipts was $1.27 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, American Indian- and Alaska Native-owned firms received just 66 cents.

- For Native Hawaiian- and Other Pacific Islander-owned firms, average per firm sales and receipts was $1.73 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Native Hawaiian- and Other Pacific Islander-owned firms received just 90 cents.

- For women-owned firms, average per firm sales and receipts was $1.56 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, women-owned firms received just 81 cents.

As discussed above, these disparities extend to the employees of minority- and women-owned firms as well and thus cause a ripple effect that further damages women and minorities. Table 4 shows that average payroll per employee at non-minority male-owned employer firms in 2012 was $48,736. In contrast:

- For African American-owned employers, average payroll per employee was just $42,824. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at African American-owned firms earned only 88 cents.

- For Hispanic-owned employers average payroll per employee was just $37,977. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Hispanic-owned firms earned only 78 cents.

- For Asian-owned employers average payroll per employee was just $45,450. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Asian-owned firms earned only 93 cents.

- For American Indian- and Alaska Native-owned employers average payroll per employee was just $44,763. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at American Indian- and Alaska Native-owned firms earned just 92 cents.

- For Native Hawaiian- and Other Pacific Islander-owned firms, on the other hand, was $49,870. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Native Hawaiian- and Other Pacific Islander-owned firms earned $1.02—essentially at par with non-minority male-owned firms.

- For women-owned employers average payroll per employee was just $46,509. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at women-owned firms earned only 95 cents.

Table 4. Disparity Ratios from the 2012 Survey of Business Owners, United States, Construction

	Number of Firms	Sales and Receipts ($000s)	Employer Firms	Sales and Receipts ($000s)	Employees	Payroll ($000s)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Levels						
All Firms	2,928,015	1,200,413,658	637,296	1,083,093,941	4,764,280	225,039,336
Non-minority male	1,840,218	936,510,929	445,288	856,603,507	3,581,982	174,571,576
African American	136,729	11,141,919	7,594	8,325,857	39,883	1,707,968
Hispanic	475,472	55,830,007	38,704	38,900,840	222,161	8,437,113
Asian	76,883	15,362,433	10,567	12,919,296	54,404	2,472,635
Native Hawaiian/Pac. Islander	5,551	1,507,949	724	1,253,656	4,803	239,527
Am. Indian & Alaska Native	35,969	7,401,462	4,836	6,124,399	29,700	1,329,464
Female	265,733	93,002,152	54,511	85,116,364	435,718	20,264,904
Panel B. Column Percentages						
All Firms	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Non-minority male	62.85%	78.02%	69.87%	79.09%	75.18%	77.57%
African American	4.67%	0.93%	1.19%	0.77%	0.84%	0.76%
Hispanic	16.24%	4.65%	6.07%	3.59%	4.66%	3.75%
Asian	2.63%	1.28%	1.66%	1.19%	1.14%	1.10%
Native Hawaiian/Pac. Islander	0.19%	0.13%	0.11%	0.12%	0.10%	0.11%
Am. Indian & Alaska Native	1.23%	0.62%	0.76%	0.57%	0.62%	0.59%
Female	9.08%	7.75%	8.55%	7.86%	9.15%	9.01%
Panel C. Disparity Ratios						
Non-minority male		*124.13*		*113.19*	*107.60*	*111.02*
African American		*19.88*		*64.51*	*70.25*	*63.69*
Hispanic		*28.64*		*59.14*	*76.78*	*61.73*
Asian		*48.74*		*71.94*	*68.87*	*66.27*
Native Hawaiian/Pac. Islander		*66.26*		101.89	88.74	93.69
Am. Indian & Alaska Native		*50.19*		*74.52*	*82.15*	*77.85*
Female		*85.37*		*91.88*	*106.92*	*105.28*

Source and Notes: *See* Table 6.

c. Results for the Professional, Scientific, and Technical Services Sector

Table 8 shows comparable 2012 SBO data for the professional, scientific, and technical services sector in the U.S. as a whole.

Column (2) in Panel B of Table 8 shows that nonminority males owned 47.45 percent of all firms and earned 66.95 percent of all sales and receipts. In contrast:

- Although African Americans owned 5.35 percent of all firms in the U.S. in 2012, they earned only 1.79 percent of all sales and receipts.

- Although Hispanics owned 7.19 percent of all firms, they earned only 3.82 percent of all sales and receipts.

- Although Asians owned 7.16 percent of all firms, they earned 7.72 percent of all sales and receipts.

- Although American Indians and Alaska Natives owned 0.8 percent of all firms, they earned only 0.36 percent of all sales and receipts.

- Although Native Hawaiians and Other Pacific Islanders owned 0.16 percent of all firms, they earned only 0.11 percent of all sales and receipts.

- Although women-owned firms were 34.5 percent of all firms, they earned only 15.81 percent of all sales and receipts.

The associated 2012 disparity indexes for firms in the construction sector can be viewed directly in Panel C of Table 8. Panel C shows that African American-owned firms in 2012 received just 33.42 percent of what would be expected based on their availability in the market. Panel C shows as well that women-owned firms received 45.82 percent of what would be expected based on their availability in the market. For Hispanics, the figure was 53.17 percent. For Asians, the figure was 107.9 percent. For American Indians and Alaska Natives, the figure was 45.12 percent, and for Native Hawaiians and Other Pacific Islanders, the figure was 65.32 percent. With the exception of Asians, these disparities are all large, adverse, and statistically significant.

We can also compare sales and receipts per firm among all firms in professional services in 2012. In Table 8, average per firm sales and receipts for non-minority male-owned firms was $319.9 thousand. In contrast:

- For African American-owned employer firms, average per firm sales and receipts was $75.8 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, African American-owned firms received just 24 cents.

- For Hispanic-owned firms, average per firm sales and receipts was $120.6 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Hispanic-owned firms received just 38 cents.

- For Asian-owned firms, average per firm sales and receipts was $244.78 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Asian-owned firms received just 76 cents.

- For American Indian- and Alaska Native-owned firms, average per firm sales and receipts was $102.3 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, American Indian- and Alaska Native-owned firms received just 32 cents.

- For Native Hawaiian- and Other Pacific Islander-owned firms, average per firm sales and receipts was $148.1 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Native Hawaiian- and Other Pacific Islander-owned firms received just 46 cents.

- For women-owned firms, average per firm sales and receipts was $103.9 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, women-owned firms received just 32 cents.

Turning to employer firms, we see from column (3) in Table 8, that although nonminority male-owned firms were 59 percent of all employer firms, they accounted for 69.13 percent of all employer firm sales and receipts. In contrast:

- Although African Americans owned 1.85 percent of all employer firms in the U.S. in 2012, they earned only 1.52 percent of all sales and receipts.

- Although Hispanics firms 3.95 percent of all employer firms, they earned only 3.45 percent of all sales and receipts.

- Asians owned 6.79 percent of all employer firms, and they earned 7.9 percent of all sales and receipts.

- Although American Indians and Alaska Natives owned 0.48 percent of all employer firms, they earned only 0.3 percent of all sales and receipts.

- Native Hawaiians and Other Pacific Islanders owned 0.08 percent of all employer firms, and they earned 0.1 percent of all sales and receipts.

- Although women owned 22.1 percent of all employer firms, they earned only 13.81 percent of all sales and receipts.

The employer firm disparity indexes for construction in 42012 appear in Panel C of Table 8. Panel C shows that African American-owned firms in 2012 received just 82.26 percent of what would be expected based on their availability in the market. Women-owned firms received just 62.47 percent of what would be expected based on their availability in the market. For Hispanics, the figure was 87.16 percent. For Asians, the figure was 116.31 percent. For American Indians and Alaska Natives, the figure was 60.94 percent, and for Native Hawaiians and Other Pacific

Islanders, the figure was 116.31 percent. The disparities for women and American Indians and Alaska Natives are large, adverse, and statistically significant. The disparities for African Americans and Hispanics are adverse and statistically significant. The disparities for Asians is not adverse and is statistically significant. The disparity for Native Hawaiians and Other Pacific Islanders is not statistically significant.

Considering sales and receipts among employer firms in 2012, Table 8 shows a figure of $1.16 million for non-minority male-owned employer firms. In contrast:

- For African American-owned employer firms, average per firm sales and receipts was $816.2 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, African American-owned firms received just 70 cents.

- For Hispanic-owned firms, average per firm sales and receipts was $864.9 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Hispanic-owned firms received just 74 cents.

- For Asian-owned firms, average per firm sales and receipts was $1.15 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Asian-owned firms received just 99 cents, just slightly below parity.

- For American Indian- and Alaska Native-owned firms, average per firm sales and receipts was $604.7 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, American Indian- and Alaska Native-owned firms received just 52 cents.

- For Native Hawaiian- and Other Pacific Islander-owned firms, average per firm sales and receipts was $1.27 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, Native Hawaiian- and Other Pacific Islander-owned firms received just $1.10, slightly above parity.

- For women-owned firms, average per firm sales and receipts was $619.9 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned firms, women-owned firms received just 53 cents.

Considering the employees of minority- and women-owned employer firms in the professional services sector, Table 8 shows that average payroll per employee at non-minority male-owned employer firms in 2012 was $63,240. In contrast:

- For African American-owned employers, average payroll per employee was just $54,911. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at African American-owned firms earned only 88 cents.

- For Hispanic-owned employers average payroll per employee was just $51,813. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Hispanic-owned firms earned only 78 cents.

- For Asian-owned employers average payroll per employee was just $66,788. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Asian-owned firms earned only 93 cents.

- For American Indian- and Alaska Native-owned employers average payroll per employee was just $44,013. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at American Indian- and Alaska Native-owned firms earned just 92 cents.

- For women-owned employers average payroll per employee was just $49,128. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at women-owned firms earned only 95 cents.

Payroll per employee for Native Hawaiian- and Other Pacific Islander-owned firms, on the other hand, was $69,386. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Native Hawaiian- and Other Pacific Islander-owned firms earned $1.10—slightly above par with non-minority male-owned firms.

Table 5. Disparity Ratios from the 2012 Survey of Business Owners, United States, Professional Services

	Number of Firms	Sales and Receipts ($000s)	Employer Firms	Sales and Receipts ($000s)	Employees	Payroll ($000s)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Levels						
All Firms	3,868,657	877,237,881	748,444	742,626,210	4,652,991	277,172,802
Non-minority male	1,835,748	587,306,112	441,573	513,381,557	3,050,082	192,887,690
African American	206,942	15,682,967	13,822	11,281,769	81,170	4,457,109
Hispanic	278,066	33,525,181	29,582	25,584,292	170,953	8,857,606
Asian	276,960	67,766,453	50,834	58,666,210	345,376	23,067,037
Native Hawaiian/Pac. Islander	6,292	931,973	600	764,525	3,680	255,342
Am. Indian & Alaska Native	30,966	3,168,244	3,627	2,193,127	17,882	787,037
Female	1,334,561	138,669,937	165,437	102,552,393	774,717	38,060,358
Panel B. Column Percentages						
All Firms	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Non-minority male	47.45%	66.95%	59.00%	69.13%	65.55%	69.59%
African American	5.35%	1.79%	1.85%	1.52%	1.74%	1.61%
Hispanic	7.19%	3.82%	3.95%	3.45%	3.67%	3.20%
Asian	7.16%	7.72%	6.79%	7.90%	7.42%	8.32%
Native Hawaiian/Pac. Islander	0.16%	0.11%	0.08%	0.10%	0.08%	0.09%
Am. Indian & Alaska Native	0.80%	0.36%	0.48%	0.30%	0.38%	0.28%
Female	34.50%	15.81%	22.10%	13.81%	16.65%	13.73%
Panel C. Disparity Ratios						
Non-minority male		*141.09*		*117.17*	*111.11*	*117.95*
African American		*33.42*		*82.26*	*94.46*	*87.07*
Hispanic		*53.17*		*87.16*	*92.96*	*80.85*
Asian		*107.90*		*116.31*	*109.29*	*122.53*
Native Hawaiian/Pac. Islander		*65.32*		128.42	98.66	114.92
Am. Indian & Alaska Native		*45.12*		*60.94*	*79.30*	*58.59*
Female		*45.82*		*62.47*	*75.32*	*62.12*

Source and Notes: See Table 6.

2. Results from the 2017 Annual Survey of Businesses

a. Economy-Wide Results

Turning now to the 2017 ABS, Table 6, below, presents results for all industries combined (*i.e.* economy-wide) and for the United States as a whole. Panel A summarizes the ABS results for each race and/or sex group. For example, Panel A shows a total of 5.47 million employer firms in the U.S. in 2017 (column 1) with overall sales and receipts of $12.689 trillion (column 2). These 5.47 million firms had a total of 62.99 million employees (column 3) and a total annual payroll expense of $2.618 trillion (column 4).

The remaining rows in Panel A provide comparable statistics for non-minority male-owned, women-owned, and minority-owned firms. For example, Table 6 shows that there were 124,004 African American-owned employer firms counted in 2017, and that these 124,004 firms registered $127.851 billion in sales and receipts. It also shows that these African American-owned firms employed a total of 1.21 million workers with an annual payroll total of $36.105 billion.

Panel B in Table 6 converts the figures in Panel A to percentage distributions within each column. For example, Column (1) in Panel B of Table 6 shows that African Americans owned just 2.27 percent of all employer firms in the U.S. and women owned just 15.62 percent. Additionally, 5.88 percent of employer firms were Hispanic-owned, 10.15 percent were Asian-owned, 0.45 percent were American Indian- and Alaska Native-owned, and 0.13 percent were Native Hawaiian- and Other Pacific Islander-owned.

Column (2) in Panel B provides the same percentage distribution for overall sales and receipts for employer firms. Table 6, for example, shows that non-minority males owned 52.08 percent of all employer firms and earned 70.71 percent of all sales and receipts. In contrast:

- Although African Americans owned 2.27 percent of all employer firms in the U.S. in 2017, they earned only 1.01 percent of all sales and receipts.

- Although Hispanics firms 5.88 percent of all employer firms, they earned only 3.33 percent of all sales and receipts.

- Although Asians owned 10.15 percent of all employer firms, they earned only 6.42 percent of all sales and receipts.

- Although American Indians and Alaska Natives owned 0.45 percent of all employer firms, they earned only 0.3 percent of all sales and receipts.

- Although Native Hawaiians and Other Pacific Islanders owned 0.13 percent of all employer firms, they earned only 0.07 percent of all sales and receipts.

- Although women owned 15.62 percent of all employer firms, they earned only 9.6 percent of all sales and receipts.

These disparities between the availability and utilization of minority- and women-owned firms can be viewed directly from the disparity indexes in Panel C of Table 6. For example, Panel C shows that African American-owned employer firms in 2017 received just 44.48 percent of what would be expected based on their availability in the market.[29] Panel C shows as well that women-owned firms received just 61.44 percent of what would be expected based on their availability in the market. For Hispanics, the figure was 56.6 percent. For Asians, the figure was 63.27 percent. For American Indians and Alaska Natives, the figure was 66.89 percent, and for Native Hawaiians and Other Pacific Islanders, the figure was 53.09 percent. These disparities are all large, adverse, and statistically significant.

Another way to look at these disparities is by comparing sales and receipts per firm. In Table 6, for example, average per firm sales and receipts for non-minority male-owned employer firms was $3.15 million.[30] In contrast:

- For African American-owned employer firms, average per firm sales and receipts was $1.03 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, African American-owned employer firms received just 33 cents.

- For Hispanic-owned employer firms, average per firm sales and receipts was $1.31 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, Hispanic-owned employer firms received just 42 cents.

- For Asian-owned employer firms, average per firm sales and receipts was $1.47 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, Asian-owned employer firms received just 47 cents.

- For American Indian- and Alaska Native-owned employer firms, average per firm sales and receipts was $1.55 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, American Indian- and Alaska Native-owned employer firms received just 49 cents.

- For Native Hawaiian- and Other Pacific Islander-owned employer firms, average per firm sales and receipts was $1.23 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, Native Hawaiian- and Other Pacific Islander-owned employer firms received just 39 cents.

- For women-owned employer firms, average per firm sales and receipts was $1.42 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, women-owned employer firms received just 45 cents.

[29] The disparity index is derived by dividing the share of sales and receipts from Panel B column (2) by the share of firms in Panel B column (1) and multiplying the result by 100.

[30] Per firm sales and receipts is derived by dividing the sales and receipts amount in Panel A column (2) by the number of employer firms in Panel A column (1).

As discussed above, these severe disparities in firm earnings have a direct negative and compounding effect on the employees of minority- and women-owned firms. Table 6, for example, shows that average payroll per employee at non-minority male-owned employer firms in 2017 was $45,555.[31] In contrast:

- For African American-owned employers, average payroll per employee was just $29,882. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at African American-owned firms earned just 66 cents.

- For Hispanic-owned employers average payroll per employee was just $31,674. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Hispanic-owned firms earned just 70 cents.

- For Asian-owned employers average payroll per employee was just $34,137. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Asian-owned firms earned just 75 cents.

- For American Indian- and Alaska Native-owned employers average payroll per employee was just $39,756. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at American Indian- and Alaska Native-owned firms earned just 87 cents.

- For Native Hawaiian- and Other Pacific Islander-owned employers it was just $35,386. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Native Hawaiian- and Other Pacific Islander-owned firms earned just 78 cents.

- For women-owned employers average payroll per employee was just $36,926. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at women-owned firms earned just 81 cents.

[31] Average payroll per employee is derived by dividing total payroll in Panel A column (4) by total number of employees in Panel A column (3).

Table 6. Disparity Ratios from the 2017 Annual Business Survey, United States, All Industries

	Employer Firms	Sales and Receipts ($000s)	Employees	Payroll ($000s)
	(1)	(2)	(3)	(4)
Panel A. Levels				
All Firms	5,474,721	12,689,937,307	62,990,475	2,618,191,164
Non-minority male	2,851,098	8,972,454,223	38,973,541	1,775,434,267
African American	124,004	127,850,815	1,208,270	36,105,467
Hispanic	322,076	422,573,589	2,872,550	90,985,526
Asian	555,638	814,806,324	4,649,688	158,725,110
Native Hawaiian/Pac. Islander	6,847	8,426,209	55,413	1,960,819
Am. Indian & Alaska Native	24,503	37,992,217	221,193	8,793,842
Female	855,136	1,217,743,211	7,863,653	290,375,358
Panel B. Column Percentages				
All Firms	100.00%	100.00%	100.00%	100.00%
Non-minority male	52.08%	70.71%	61.87%	67.81%
African American	2.27%	1.01%	1.92%	1.38%
Hispanic	5.88%	3.33%	4.56%	3.48%
Asian	10.15%	6.42%	7.38%	6.06%
Native Hawaiian/Pac. Islander	0.13%	0.07%	0.09%	0.07%
Am. Indian & Alaska Native	0.45%	0.30%	0.35%	0.34%
Female	15.62%	9.60%	12.48%	11.09%
Panel C. Disparity Ratios		(2) vs. (1)	(3) vs. (1)	(4) vs. (1)
Non-minority male		*135.77*	*118.81*	*130.21*
African American		*44.48*	*84.69*	*60.88*
Hispanic		*56.60*	*77.52*	*59.07*
Asian		*63.27*	*72.73*	*59.73*
Native Hawaiian/Pac. Islander		*53.09*	*70.34*	*59.88*
Am. Indian & Alaska Native		*66.89*	*78.46*	*75.04*
Female		*61.44*	*79.92*	*71.00*

- Source: Authors calculations from the 2017 ABS. Notes: (1) Figures are rounded. Rounding was performed subsequent to any mathematical calculations; (2) Excludes publicly owned, foreign-owned, and not-for-profit firms; (3) Totals for "All Firms" includes firms that were equally nonminority-minority owned; (4) Statistically significant; disparity indexes are italicized; (5) "n/a" indicates that data were not disclosed due to confidentiality or other publication restrictions.

b. Results for the Construction Sector

Table 7 provides comparable 2017 information for the construction sector, which, along with architecture, engineering, and related professional services, is a major recipient of federal surface and aviation transportation funding.

Although non-minority males owned 68.52 percent of all employer firms in the construction sector, they earned 77.92 percent of all sales and receipts. In contrast:

- Although African Americans owned 1.17 percent of all employer firms in the U.S. in 2017, they earned only 0.72 percent of all sales and receipts. This yields a disparity index of 61.05.

- Although Hispanics owned 7.16 percent of all employer firms in the U.S. in 2017, they earned only 4.1 percent of all sales and receipts. This yields a disparity index of 57.26.

- Although Asians owned 2.02 percent of all employer firms in the U.S. in 2017, they earned only 1.37 percent of all sales and receipts. This yields a disparity index of 67.73.

- Although Native Hawaiians and Other Pacific Islanders owned 0.16 percent of all employer firms in the U.S. in 2017, they earned only 0.1 percent of all sales and receipts. This yields a disparity index of 62.97.

- Although American Indians and Alaska Natives owned 0.69 percent of all employer firms in the U.S. in 2017, they earned only 0.52 percent of all sales and receipts. This yields a disparity index of 76.15.

As a group, women fared much better in construction in 2017 compared to other disadvantaged groups. Women owned 7.15 percent of all employer firms in the U.S. in 2017, and they earned an equivalent share of sales and receipts—7.26 percent, yielding no adverse disparity index. But remember, this new ABS data does not include emerging firms that have yet grown sufficiently large to hire employees.

When we consider per firm sales and receipts for employer firms in 2017, we see that non-minority male-owned firms averaged $2.51 million. In contrast:

- For African American-owned employer firms, average per firm sales and receipts was 1.35 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, African American-owned employer firms received just 54 cents.

- For Hispanic-owned employer firms, average per firm sales and receipts was 1.26 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, Hispanic-owned employer firms received just 50 cents.

- For Asian-owned employer firms, average per firm sales and receipts was 1.49 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, Asian-owned employer firms received just 60 cents.

- For American Indian- and Alaska Native-owned employer firms, average per firm sales and receipts was 1.68 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, American Indian- and Alaska Native-owned employer firms received just 67 cents.

- For Native Hawaiian- and Other Pacific Islander-owned employer firms, average per firm sales and receipts was 1.39 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, Native Hawaiian- and Other Pacific Islander-owned employer firms received just 55 cents.

- For women-owned employer firms, average per firm sales and receipts was 2.24 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, women-owned employer firms received just 89 cents.

Considering the employees of these minority- and women-owned firms, Table 7 shows that average payroll per employee at non-minority male-owned employer firms the construction sector in 2017 was $54,984. In contrast:

- For African American-owned employers, average payroll per employee was just $45,869. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at African American-owned firms earned just 83 cents.

- For Hispanic-owned employers average payroll per employee was just $41,881. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Hispanic-owned firms earned just 76 cents.

- For Asian-owned employers average payroll per employee was just $50,307. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Asian-owned firms earned 91 cents.

- For American Indian- and Alaska Native-owned employers average payroll per employee was just $51,723. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at American Indian- and Alaska Native-owned firms earned 94 cents.

- For Native Hawaiian- and Other Pacific Islander-owned employers it was just $46,120 male-owned firms, employees at Native Hawaiian- and Other Pacific Islander-owned firms earned just 84 cents.

- For women-owned employers average payroll per employee was just $53,318. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at women-owned firms earned 97 cents.

Table 7. Disparity Ratios from the 2017 Annual Business Survey, United States, Construction

	Employer Firms	Sales and Receipts ($000s)	Employees	Payroll ($000s)
	(3)	(4)	(5)	(6)
Panel A. Levels				
All Firms	700,453	1,544,490,456	6,120,046	324,999,296
Non-minority male	479,971	1,203,446,334	4,504,618	247,682,903
African American	8,218	11,062,034	54,093	2,481,191
Hispanic	50,187	63,362,420	327,799	13,728,565
Asian	14,169	21,160,223	82,746	4,162,689
Native Hawaiian/Pac. Islander	1,093	1,517,730	7,795	359,508
Am. Indian & Alaska Native	4,821	8,095,145	35,355	1,828,684
Female	50,075	112,156,157	508,141	27,092,808
Panel B. Column Percentages				
All Firms	100.00%	100.00%	100.00%	100.00%
Non-minority male	68.52%	77.92%	73.60%	76.21%
African American	1.17%	0.72%	0.88%	0.76%
Hispanic	7.16%	4.10%	5.36%	4.22%
Asian	2.02%	1.37%	1.35%	1.28%
Native Hawaiian/Pac. Islander	0.16%	0.10%	0.13%	0.11%
Am. Indian & Alaska Native	0.69%	0.52%	0.58%	0.56%
Female	7.15%	7.26%	8.30%	8.34%
Panel C. Disparity Ratios		(2) vs. (1)	(3) vs. (1)	(4) vs. (1)
Non-minority male		*113.71*	*107.42*	*111.22*
African American		*61.05*	*75.34*	*65.07*
Hispanic		*57.26*	*74.76*	*58.96*
Asian		*67.73*	*66.84*	*63.32*
Native Hawaiian/Pac. Islander		*62.97*	*81.62*	*70.89*
Am. Indian & Alaska Native		*76.15*	*83.93*	*81.75*
Female		101.58	116.14	116.61

- Source and Notes: See Table 6.

c. Results for the Professional, Scientific, and Technical Sector

Table 8 provides comparable 2017 information for the professional, scientific, and technical sector (which includes architecture, engineering, and related professional services). This sector, along with construction, is a major recipient of federal surface and aviation transportation funding.

Although non-minority males owned 56.31 percent of all employer firms in the construction sector, they earned 66.39 percent of all sales and receipts. In contrast:

- Although African Americans owned 2.06 percent of all employer firms in the U.S. in 2017, they earned only 1.6 percent of all sales and receipts. This yields a disparity index of 77.65.

- Although Hispanics owned 4.32 percent of all employer firms in the U.S. in 2017, they earned only 3.2 percent of all sales and receipts. This yields a disparity index of 74.09.

- Although Asians owned 7.67 percent of all employer firms in the U.S. in 2017, they earned only 8.84 percent of all sales and receipts. This yields a disparity index of 115.31.

- Although Native Hawaiians and Other Pacific Islanders owned 0.12 percent of all employer firms in the U.S. in 2017, they earned only 0.1 percent of all sales and receipts. This yields a disparity index of 84.87.

- Although American Indians and Alaska Natives owned 0.52 percent of all employer firms in the U.S. in 2017, they earned only 0.52 percent of all sales and receipts. This yields a disparity index of 99.76.

- Although women owned 19.1 percent of all employer firms in the U.S. in 2017, they earned only 12.4 percent of all sales and receipts. This yields a disparity index of 64.91.

When we consider per firm sales and receipts for employer firms, we see that non-minority male-owned firms averaged $1.37 million in 2017. In contrast:

- For African American-owned employer firms, average per firm sales and receipts was $902 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, African American-owned employer firms received just 66 cents.

- For Hispanic-owned employer firms, average per firm sales and receipts was $861 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, Hispanic-owned employer firms received just 63 cents.

- For Asian-owned employer firms, average per firm sales and receipts was $1.34 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, Asian-owned employer firms received just 98 cents.

- For Native Hawaiian- and Other Pacific Islander-owned employer firms, average per firm sales and receipts was $986 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, Native Hawaiian- and Other Pacific Islander-owned employer firms received just 72 cents.

- For American Indian- and Alaska Native-owned employer firms, average per firm sales and receipts was $1.16 million. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, American Indian- and Alaska Native-owned employer firms received just 85 cents.

- For women-owned employer firms, average per firm sales and receipts was $754 thousand. In other words, for every dollar of sales and receipts earned by non-minority male-owned employer firms, women-owned employer firms received just 55 cents.

Considering the employees of these minority- and women-owned firms, Table 8 shows that average payroll per employee at non-minority male-owned employer firms the professional services sector in 2017 was $70,546. In contrast:

- For African American-owned employers, average payroll per employee was just $59,033. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at African American-owned firms earned just 84 cents.

- For Hispanic-owned employers average payroll per employee was just $56,567. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Hispanic-owned firms earned just 80 cents.

- For Asian-owned employers average payroll per employee was $75,179—somewhat higher than non-minority male-owned employers. Thus, for every $1 in wages earned by employees at non-minority male-owned firms, employees at Asian-owned firms earned $1.07 cents, slightly better than parity.

- For American Indian- and Alaska Native-owned employers average payroll per employee was just $60,884. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at American Indian- and Alaska Native-owned firms earned 86 cents.

- For Native Hawaiian- and Other Pacific Islander-owned employers it was just $63,009 male-owned firms, employees at Native Hawaiian- and Other Pacific Islander-owned firms earned just 89 cents.

- For women-owned employers average payroll per employee was just $55,606. In other words, for every $1 in wages earned by employees at non-minority male-owned firms, employees at women-owned firms earned 79 cents.

Table 8. Disparity Ratios from the 2017 Annual Business Survey, United States, Professional, Scientific, and Technical Services

	Employer Firms	Sales and Receipts ($000s)	Employees	Payroll ($000s)
	(3)	(4)	(5)	(6)
Panel A. Levels				
All Firms	794,235	922,698,077	5,339,009	362,594,623
Non-minority male	447,254	612,610,502	3,281,827	231,520,629
African American	16,392	14,787,229	96,267	5,682,935
Hispanic	34,292	29,514,634	185,395	10,487,211
Asian	60,907	81,592,941	432,567	32,520,040
Native Hawaiian/Pac. Islander	971	957,403	6,118	385,489
Am. Indian & Alaska Native	4,142	4,800,227	29,953	1,823,661
Female	151,694	114,396,323	751,207	41,771,294
Panel B. Column Percentages				
All Firms	100.00%	100.00%	100.00%	100.00%
Non-minority male	56.31%	66.39%	61.47%	63.85%
African American	2.06%	1.60%	1.80%	1.57%
Hispanic	4.32%	3.20%	3.47%	2.89%
Asian	7.67%	8.84%	8.10%	8.97%
Native Hawaiian/Pac. Islander	0.12%	0.10%	0.11%	0.11%
Am. Indian & Alaska Native	0.52%	0.52%	0.56%	0.50%
Female	19.10%	12.40%	14.07%	11.52%
Panel C. Disparity Ratios		(2) vs. (1)	(3) vs. (1)	(4) vs. (1)
Non-minority male		*117.90*	*109.16*	*113.39*
African American		*77.65*	*87.36*	*75.94*
Hispanic		*74.09*	*80.43*	*66.99*
Asian		*115.31*	*105.65*	*116.95*
Native Hawaiian/Pac. Islander		84.87	93.73	86.96
Am. Indian & Alaska Native		99.76	107.58	96.44
Female		*64.91*	*73.67*	*60.32*

Source and Notes: See Table 6.

3. State-Level Results from 2002-2017

The state-level disparities observed in the 2017 ABS are documented below in Appendix A, Tables A.1 through A.18. Data from the 2012 SBO is presented in Appendix B, Tables B.1 through B.18. Data from the 2007 SBO is presented in Appendix C, Tables C.1 through C.18. Data from the 2002 SBO is presented in Appendix D, Tables D.1 through D.18.

The most noticeable aspect of the statistics presented in Tables A.1 through D.18 below is how many of the disparity indexes are large, adverse, and statistically significant.[32] This is true for African Americans, Hispanics, Asians and Pacific Islanders, American Indians and Alaska Natives, and non-minority women. It is true in the construction sector, it is true in the professional services sector, and it is true when considering all industries combined. It is true in all 50 states and the District of Columbia. While there is certainly variation by race, sex, industry, geography, and time, the similarities vastly outweigh the differences. Table 9 provides a high-level summary of the findings of disparity from the 2007 SBO in Tables A.1 through A.18.

[32] I have measured statistical significance here using the "two standard deviation" or "5%" level of significance typically used in disparate impact litigation in employment and related areas.

Table 9. Prevalence of Disparities in the 2017 Annual Business Survey and the 2012, 2007 & 2002 Survey of Business Owners

Year	Industry	Number of Disparity Indexes in Table	Race/ Sex Group	Fraction of Disparity Indexes Less than or Equal to 80	Fraction of Disparity Indexes Less than or Equal to 100	Fraction of Disparity Indexes that are Statistically Significant
2017	All Industries	48	AfrAmer	98%	100%	88%
2012	All Industries	96	AfrAmer	97%	98%	92%
2007	All Industries	96	AfrAmer	93%	97%	90%
2002	All Industries	100	AfrAmer	98%	100%	98%
2017	Construction	39	AfrAmer	77%	82%	46%
2012	Construction	84	AfrAmer	88%	93%	80%
2007	Construction	84	AfrAmer	85%	90%	82%
2002	Construction	69	AfrAmer	86%	88%	72%
2017	Professional Services	41	AfrAmer	73%	80%	49%
2012	Professional Services	92	AfrAmer	78%	90%	70%
2007	Professional Services	92	AfrAmer	76%	88%	73%
2002	Professional Services	86	AfrAmer	94%	98%	80%
2017	All Industries	52	Hispanic	87%	94%	79%
2012	All Industries	101	Hispanic	87%	94%	84%
2007	All Industries	101	Hispanic	82%	90%	86%
2002	All Industries	102	Hispanic	100%	100%	100%
2017	Construction	49	Hispanic	86%	92%	61%
2012	Construction	95	Hispanic	89%	96%	79%
2007	Construction	95	Hispanic	87%	93%	78%
2002	Construction	85	Hispanic	88%	91%	81%
2017	Professional Services	48	Hispanic	42%	65%	29%
2012	Professional Services	97	Hispanic	63%	79%	54%
2007	Professional Services	97	Hispanic	65%	75%	57%
2002	Professional Services	84	Hispanic	93%	94%	74%
2017	All Industries	52	Asian	98%	98%	96%
2012	All Industries	104	Asian	68%	89%	73%
2007	All Industries	104	Asian	75%	96%	80%
2002	All Industries	102	Asian	100%	100%	100%
2017	Construction	40	Asian	72%	75%	38%
2012	Construction	84	Asian	70%	75%	57%
2007	Construction	84	Asian	71%	77%	54%
2002	Construction	58	Asian	74%	90%	53%
2017	Professional Services	49	Asian	14%	29%	16%
2012	Professional Services	100	Asian	21%	33%	34%
2007	Professional Services	100	Asian	15%	28%	32%
2002	Professional Services	88	Asian	64%	77%	51%

Year	Industry	Number of Disparity Indexes in Table	Race/ Sex Group	Fraction of Disparity Indexes Less than or Equal to 80	Fraction of Disparity Indexes Less than or Equal to 100	Fraction of Disparity Indexes that are Statistically Significant
2017	All Industries	36	NHPI	81%	86%	58%
2012	All Industries	71	NHPI	86%	86%	70%
2007	All Industries	71	NHPI	86%	93%	72%
2002	All Industries	48	NHPI	100%	100%	96%
2017	Construction	11	NHPI	73%	73%	45%
2012	Construction	33	NHPI	76%	79%	74%
2007	Construction	33	NHPI	73%	79%	58%
2002	Construction	10	NHPI	70%	80%	50%
2017	Professional Services	13	NHPI	69%	77%	46%
2012	Professional Services	31	NHPI	68%	75%	73%
2007	Professional Services	31	NHPI	52%	58%	39%
2002	Professional Services	13	NHPI	92%	92%	85%
2017	All Industries	49	AIAN	76%	88%	55%
2012	All Industries	94	AIAN	89%	97%	82%
2007	All Industries	94	AIAN	91%	98%	82%
2002	All Industries	96	AIAN	99%	99%	98%
2017	Construction	39	AIAN	59%	72%	23%
2012	Construction	74	AIAN	72%	81%	53%
2007	Construction	74	AIAN	73%	85%	54%
2002	Construction	74	AIAN	81%	91%	64%
2017	Professional Services	33	AIAN	52%	67%	27%
2012	Professional Services	79	AIAN	79%	92%	51%
2007	Professional Services	79	AIAN	68%	80%	43%
2002	Professional Services	71	AIAN	90%	92%	76%
2017	All Industries	52	NMF	100%	100%	98%
2012	All Industries	104	NMF	98%	99%	98%
2007	All Industries	104	NMF	98%	100%	100%
2002	All Industries	104	NMF	100%	100%	100%
2017	Construction	52	NMF	21%	54%	2%
2012	Construction	103	NMF	30%	56%	16%
2007	Construction	103	NMF	36%	67%	23%
2002	Construction	42	NMF	71%	86%	50%
2017	Professional Services	52	NMF	92%	100%	83%
2012	Professional Services	103	NMF	97%	100%	94%
2007	Professional Services	103	NMF	99%	99%	94%
2002	Professional Services	54	NMF	100%	100%	98%

Source: Author's calculations from the 2017 ABS, and the 2012, 2007 and 2002 SBO. Note: "NHPI" stands for Native Hawaiians and Other Pacific Islanders, "AIAN" stands for American Indians and Alaska Natives, and "NMF" stands for non-minority female.

a. Conclusions from the Survey of Business Owners/Annual Business Survey Data

While the exact proportions vary, large and statistically significant disparities are observed in the U.S. as a whole, in all 50 states and the District of Columbia, for all minority groups—African Americans, Hispanics, Asians and Pacific Islanders, and American Indians and Alaska Natives—as well as for non-minority women. These disparities are found in the Construction sector, the Professional, Scientific and Technical Services Sector (which includes Architecture, Engineering and related industries), and in the economy as a whole.

D. There is Strong Evidence of Disparities and Discrimination in Minority and Female Business Formation Rates and Earnings

It is fair to ask whether the disparities documented in most disparity studies and in the SBO and ABS data result primarily from discrimination, or whether they result from other, potentially non-discriminatory, factors.

This question can be tested directly using the *American Community Survey 5-year Public Use Microdata Sample* (ACS PUMS), which allows us to examine business outcomes for different race, ethnic, and gender groups in great detail while holding constant a wide variety of other demographic and economic variables.

1. Discrimination Impacting Business Formation

a. Methods

To assess the extent of discrimination in business formation, I developed three different statistical regression models.[33] In "Model A", the only independent variables included in the analysis are indicators for race and sex and survey year. This model identifies the raw differences in business formation rates between minorities, women, and non-minority males, holding only time constant.

Next, "Model B" adds to the regression equation several independent variables that are indicators of qualifications and capacity, including schooling, state of residence, and age.[34] This allows us to compare individuals that are similarly situated in terms of their educational attainment, their geographic location, and their labor market experience.

[33] Regression analysis is a type of statistical analysis that examines the correlation between two variables ("regression") or three or more variables ("multiple regression" or "multivariate regression") in a mathematical model by determining the line of best fit through a series of data points. In simpler terms, regression analysis is a statistical technique allowing the comparison between certain business outcomes, such as business formation, business earnings, or loan denials, and minority or female status, while holding other, potentially non-discriminatory factors, such as geographic location, industry affiliation, education, age, or balance sheets, constant.

[34] A person's age is a widely-used proxy for their labor market experience and enters the regression equation quadratically.

Finally, "Model C" adds to the regression equation a large number of independent variables that have been shown to be related to the propensity to become a business owner. These include proxies for individual financial assets (interest and dividend income, home ownership status, and home property value), family structure (spouse present in the household, number of children in the household), mobility (lived in the same house last year), immigration status (foreign born, years in the U.S, English proficiency), military status (veteran), and local macroeconomic conditions by state (general population level, unemployment rate, number of full-time government employees, per capita personal income).[35]

Taken together, these three models allow us to test whether discrimination is the primary explanation for observed business disparities for minorities and women. If disparity indexes remain adverse, large, and statistically significant throughout Models A, B and C, then the answer is "Yes."

b. Data

The data used for the analyses in this section are the most recent *2014-2018 American Community Survey 5-year Public Use Microdata Sample* (ACS), which allows us to examine business outcomes for different race, ethnic, and gender groups in great detail while holding constant a wide variety of other demographic and economic variables.[36]

The analyses undertaken in this section require individual-level data (*i.e.,* "microdata") with relevant information on business ownership status and other key socioeconomic characteristics. The *American Community Survey* is an ongoing annual survey covering the same type of information that was formerly collected in the decennial census "long form." The ACS is sent to approximately 3.5 million addresses annually, including housing units in all counties in the 50 states and the District of Columbia.[37] The PUMS file from the ACS contains records for a subsample of the full ACS. The data used here are the multi-year estimates combining the 2014 through 2018 ACS PUMS records. The combined file contains over six million person-level records. The 2014-2018 ACS PUMS provides the full range of population and housing information collected in the annual ACS and in the decennial census. Business ownership status is identified in the ACS PUMS through the "class of worker" variable, which distinguishes the unincorporated and incorporated self-employed from others in the labor force. The presence of the class of worker variable allows us to construct a detailed cross-sectional sample of individual business owners and their associated earnings. The ACS PUMS universe for all of the analyses presented below includes all prime age (16-64) private sector labor force participants.

c. Economy-Wide Findings

I estimated Models A, B and C across four different industry groupings in the U.S.: (1) the entire economy, (2) the construction sector, and (3) the Architecture/Engineering sector. These results are reported below in Tables 10-12.

[35] Interest and dividend income and per capita personal income are included in the model in their logarithmic forms.

[36] These ACS data were released in January 2020. *See* U.S. Census Bureau (2020d).

[37] U.S. Census Bureau (2013).

For the economy as a whole, the results are presented in Table 10. Model A identifies large, adverse, and statistically significant disparities in business formation rates in 2014-2018 for all minority groups and for women. The results for Model A show:

- For African Americans, the observed self-employment rate is 5.7 percent and the model predicts that it would be 6.7 percentage points higher—12.5 percent—if African Americans faced the same market outcomes as non-minority males. This yields a disparity index of 46.

- For Hispanics, the observed self-employment rate is 9.2 percent and the model predicts that it would be 3.8 percentage points higher—13 percent—if Hispanics faced the same market outcomes as non-minority males. This yields a disparity index of 70.9.

- For Asian and Pacific Islanders, the observed self-employment rate is 10 percent and the model predicts that it would be 3 percentage points higher—13 percent—if Asian and Pacific Islanders faced the same market outcomes as non-minority males. This yields a disparity index of 76.8.

- For American Indians and Alaska Natives, the observed self-employment rate is 8.7 percent and the model predicts that it would be 3.7 percentage points higher—12.4 percent—if American Indians and Alaska Natives faced the same market outcomes as non-minority males. This yields a disparity index of 70.3.

- For minorities as a group, the observed self-employment rate is 8.3 percent and the model predicts that it would be 4.8 percentage points higher—13.1 percent—if minorities as a group faced the same market outcomes as non-minority males. This yields a disparity index of 63.2.

- For non-minority females, the observed self-employment rate is 9 percent and the model predicts that it would be 4 percentage points higher—13 percent—if non-minority females faced the same market outcomes as non-minority males. This yields a disparity index of 69.1.

For minorities and women as a group, the observed self-employment rate is 8.6 percent and the model predicts that it would be 4.9 percentage points higher—13.4 percent—if minorities and women as a group faced the same market outcomes as non-minority males. This yields a disparity index of 63.7.Despite the addition of important qualifications and capacity variables, the results for Model B show that, for the economy as a whole, disparities in business formation rates remain large, adverse, and statistically significant even when we compare individuals that are similarly-situated in terms of their educational attainment, their geographic location, and their labor market experience. Specifically, the results for Model B show:

- For African Americans, the observed self-employment rate is 5.7 percent and the model predicts that it would be 5.9 percentage points higher—11.6 percent—if African Americans faced the same market outcomes as non-minority males. This yields a disparity index of 49.5.

- For Hispanics, the observed self-employment rate is 9.2 percent and the model predicts that it would be 3.3 percentage points higher—12.5 percent—if Hispanics faced the same market outcomes as non-minority males. This yields a disparity index of 73.9.

- For Asian and Pacific Islanders, the observed self-employment rate is 10 percent and the model predicts that it would be 3.2 percentage points higher—13.1 percent—if Asian and Pacific Islanders faced the same market outcomes as non-minority males. This yields a disparity index of 75.9.

- For American Indians and Alaska Natives, the observed self-employment rate is 8.7 percent and the model predicts that it would be 3.5 percentage points higher—12.2 percent—if American Indians and Alaska Natives faced the same market outcomes as non-minority males. This yields a disparity index of 71.4.

- For minorities as a group, the observed self-employment rate is 9 percent and the model predicts that it would be 3.6 percentage points higher—12.5 percent—if minorities as a group faced the same market outcomes as non-minority males. This yields a disparity index of 71.6.

- For non-minority females, the observed self-employment rate is 8.3 percent and the model predicts that it would be 4.3 percentage points higher—12.6 percent—if non-minority females faced the same market outcomes as non-minority males. This yields a disparity index of 65.7.

- For minorities and women as a group, the observed self-employment rate is 8.6 percent and the model predicts that it would be 4.3 percentage points higher—12.9 percent—if minorities and women as a group faced the same market outcomes as non-minority males. This yields a disparity index of 66.5.

In Model C, numerous additional variables are included that measure individual financial assets, family structure, mobility, immigration status, military status, and local macroeconomic conditions. Despite the inclusion of all these additional explanatory variables, the results still show that disparities in business formation rates remain large, adverse, and statistically significant when we compare individuals who are also similarly-situated in terms of these additional measures. The specific results for Model C show:

- For African Americans, the observed self-employment rate is 5.7 percent and the model predicts that it would be 5.4 percentage points higher—11.2 percent—if African Americans faced the same market outcomes as non-minority males. This yields a disparity index of 51.5.

- For Hispanics, the observed self-employment rate is 9.2 percent and the model predicts that it would be 4.3 percentage points higher—13.5 percent—if Hispanics faced the same market outcomes as non-minority males. This yields a disparity index of 68.4.

- For Asian and Pacific Islanders, the observed self-employment rate is 10 percent and the model predicts that it would be 5 percentage points higher—14.9 percent—if Asian and Pacific Islanders faced the same market outcomes as non-minority males. This yields a disparity index of 66.7.

- For American Indians and Alaska Natives, the observed self-employment rate is 8.7 percent and the model predicts that it would be 3.2 percentage points higher—11.9 percent—if American Indians and Alaska Natives faced the same market outcomes as non-minority males. This yields a disparity index of 73.3.

- For minorities as a group, the observed self-employment rate is 9 percent and the model predicts that it would be 3.5 percentage points higher—12.4 percent—if minorities as a group faced the same market outcomes as non-minority males. This yields a disparity index of 72.1.

- For non-minority females, the observed self-employment rate is 8.3 percent and the model predicts that it would be 5.1 percentage points higher—13.4 percent—if non-minority females faced the same market outcomes as non-minority males. This yields a disparity index of 61.9.

- For minorities and women as a group, the observed self-employment rate is 8.6 percent and the model predicts that it would be 4.5 percentage points higher—13.1 percent—if minorities and women as a group faced the same market outcomes as non-minority males. This yields a disparity index of 65.6.

Table 10. Actual and Potential Minority and Female Business Formation Rates, 2014-2018, All Industries.

Race, Location	Current Business Formation Rate (%)	Expected Business Formation Rate (%)	Disparity Index
	(1)	(2)	(3)
Regression Model A			
African American	5.74	12.48	*45.99*
Hispanic	9.21	12.99	*70.90*
Asian and Pacific Islander	9.96	12.97	*76.79*
American Indian and Alaska Native	8.70	12.38	*70.27*
Two or More Races	8.87	12.66	*70.06*
Minority	8.27	13.08	*63.23*
Non-minority female	8.95	12.96	*69.06*
DBE	8.56	13.44	*63.69*
Non-minority male	13.09		
Regression Model B			
African American	5.74	11.60	*49.48*
Hispanic	9.21	12.46	*73.92*
Asian and Pacific Islander	9.96	13.12	*75.91*
American Indian and Alaska Native	8.70	12.18	*71.43*
Two or More Races	8.87	11.06	*80.20*
Minority	8.27	12.58	*65.74*
Non-minority female	8.95	12.50	*71.60*
DBE	8.56	12.87	*66.51*
Non-minority male	13.09		
Regression Model C			
African American	5.74	11.15	*51.48*
Hispanic	9.21	13.46	*68.42*
Asian and Pacific Islander	9.96	14.93	*66.71*
American Indian and Alaska Native	8.70	11.87	*73.29*
Two or More Races	8.87	11.06	*80.20*
Minority	8.27	13.35	*61.95*
Non-minority female	8.95	12.41	*72.12*
DBE	8.56	13.05	*65.59*
Non-minority male	13.09		

- Source and Notes: Calculations by the author from the 2014-2018 ACS PUMS. Disparity Indexes in italics are statistically significant at a 95 percent probability level or better.

d. Findings for Construction

When the scope of the inquiry is limited to just the construction industries, the results appear in Table 11. When we examine just the construction industry, Model A identifies large, adverse, and statistically significant disparities in business formation rates in 2014-2018 for all minority groups and for women. The results for Model A show:

- For African Americans, the observed self-employment rate is 17.8 percent and the model predicts that it would be 8.9 percentage points higher—26.6 percent—if African Americans faced the same market outcomes as non-minority males. This yields a disparity index of 66.7.

- For Hispanics, the observed self-employment rate is 17.9 percent and the model predicts that it would be 8.7 percentage points higher—26.6 percent—if Hispanics faced the same market outcomes as non-minority males. This yields a disparity index of 67.3.

- For Asian and Pacific Islanders, the observed self-employment rate is 23.6 percent and the model predicts that it would be 3.9 percentage points higher—27.5 percent—if Asian and Pacific Islanders faced the same market outcomes as non-minority males. This yields a disparity index of 85.9.

- For American Indians and Alaska Natives, the observed self-employment rate is 19.1 percent and the model predicts that it would be 9.1 percentage points higher—28.2 percent—if American Indians and Alaska Natives faced the same market outcomes as non-minority males. This yields a disparity index of 67.9.

- For minorities as a group, the observed self-employment rate is 18.3 percent and the model predicts that it would be 8.5 percentage points higher—26.8 percent—if minorities as a group faced the same market outcomes as non-minority males. This yields a disparity index of 68.2.

- For non-minority females, the observed self-employment rate is 17.9 percent and the model predicts that it would be 9 percentage points higher—26.9 percent—if non-minority females faced the same market outcomes as non-minority males. This yields a disparity index of 66.5.

- For minorities and women as a group, the observed self-employment rate is 18.2 percent and the model predicts that it would be 8.9 percentage points higher—27.1 percent—if minorities and women as a group faced the same market outcomes as non-minority males. This yields a disparity index of 67.3.

Despite the addition of important qualifications and capacity variables, the results for Model B show that, for the economy as a whole, disparities in business formation rates remain large, adverse, and statistically significant even when we compare individuals that are similarly-situated in terms of their educational attainment, their geographic location, and their labor market experience. Specifically, the results for Model B show:

- For African Americans, the observed self-employment rate is 17.8 percent and the model predicts that it would be 8.7 percentage points higher—26.5 percent—if African Americans faced the same market outcomes as non-minority males. This yields a disparity index of 67.2.

- For Hispanics, the observed self-employment rate is 17.9 percent and the model predicts that it would be 5.6 percentage points higher—23.5 percent—if Hispanics faced the same market outcomes as non-minority males. This yields a disparity index of 76.1.

- For Asian and Pacific Islanders, the observed self-employment rate is 23.6 percent and the model predicts that it would be 2.9 percentage points higher—26.5 percent—if Asian and Pacific Islanders faced the same market outcomes as non-minority males. This yields a disparity index of 89.1.

- For American Indians and Alaska Natives, the observed self-employment rate is 19.1 percent and the model predicts that it would be 7.9 percentage points higher—27 percent—if American Indians and Alaska Natives faced the same market outcomes as non-minority males. This yields a disparity index of 70.9.

- For minorities as a group, the observed self-employment rate is 17.9 percent and the model predicts that it would be 10 percentage points higher—27.9 percent—if minorities as a group faced the same market outcomes as non-minority males. This yields a disparity index of 64.1.

- For non-minority females, the observed self-employment rate is 18.3 percent and the model predicts that it would be 6.1 percentage points higher—24.3 percent—if non-minority females faced the same market outcomes as non-minority males. This yields a disparity index of 75.

- For minorities and women as a group, the observed self-employment rate is 18.2 percent and the model predicts that it would be 7.5 percentage points higher—25.7 percent—if minorities and women as a group faced the same market outcomes as non-minority males. This yields a disparity index of 71.

In Model C, numerous additional variables are included that measure individual financial assets, family structure, mobility, immigration status, military status, and local macroeconomic conditions. Despite the inclusion of all these additional explanatory variables, the results still show that disparities in business formation rates remain large, adverse, and statistically significant when we compare individuals who are also similarly-situated in terms of these additional measures. The specific results for Model C show:

- For African Americans, the observed self-employment rate is 17.8 percent and the model predicts that it would be 7.5 percentage points higher—25.3 percent—if African Americans faced the same market outcomes as non-minority males. This yields a disparity index of 70.4.

- For Hispanics, the observed self-employment rate is 17.9 percent and the model predicts that it would be 9 percentage points higher—26.9 percent—if Hispanics faced the same market outcomes as non-minority males. This yields a disparity index of 66.5.

- For Asian and Pacific Islanders, the observed self-employment rate is 23.6 percent and the model predicts that it would be 6.8 percentage points higher—30.5 percent—if Asian and Pacific Islanders faced the same market outcomes as non-minority males. This yields a disparity index of 77.6.

- For American Indians and Alaska Natives, the observed self-employment rate is 19.1 percent and the model predicts that it would be 7.9 percentage points higher—27.1 percent—if American Indians and Alaska Natives faced the same market outcomes as non-minority males. This yields a disparity index of 70.7.

- For minorities as a group, the observed self-employment rate is 17.9 percent and the model predicts that it would be 10.3 percentage points higher—28.2 percent—if minorities as a group faced the same market outcomes as non-minority males. This yields a disparity index of 63.4.

- For non-minority females, the observed self-employment rate is 18.3 percent and the model predicts that it would be 8.1 percentage points higher—26.4 percent—if non-minority females faced the same market outcomes as non-minority males. This yields a disparity index of 69.2.

- For minorities and women as a group, the observed self-employment rate is 18.2 percent and the model predicts that it would be 9.5 percentage points higher—27.7 percent—if minorities and women as a group faced the same market outcomes as non-minority males. This yields a disparity index of 65.8.

Table 11. Actual and Potential Minority Business and Female Formation Rates, 2014-2018, Construction.

Race, Location	Current Business Formation Rate (%)	Expected Business Formation Rate (%)	Disparity Index
	(1)	(2)	(3)
Regression Model A			
African American	17.78	26.64	*66.74*
Hispanic	17.90	26.58	*67.34*
Asian and Pacific Islander	23.64	27.52	*85.90*
American Indian and Alaska Native	19.13	28.19	*67.86*
Two or More Races	20.10	25.79	*77.94*
Minority	18.25	26.77	*68.17*
Non-minority female	17.91	26.92	*66.53*
DBE	18.20	27.06	*67.26*
Non-minority male	26.84		
Regression Model B			
African American	17.78	26.47	*67.17*
Hispanic	17.90	23.52	*76.11*
Asian and Pacific Islander	23.64	26.53	*89.11*
American Indian and Alaska Native	19.13	27.00	*70.85*
Two or More Races	20.10	22.43	*89.61*
Minority	18.25	24.33	*75.01*
Non-minority female	17.91	27.92	*64.15*
DBE	18.20	25.65	*70.96*
Non-minority male	26.84		
Regression Model C			
African American	17.78	25.27	*70.36*
Hispanic	17.90	26.90	*66.54*
Asian and Pacific Islander	23.64	30.45	*77.64*
American Indian and Alaska Native	19.13	27.06	*70.69*
Two or More Races	20.10	22.62	*88.86*
Minority	18.25	28.24	*63.42*
Non-minority female	17.91	26.38	*69.18*
DBE	18.20	27.65	*65.82*
Non-minority male	26.84		

- Source and Notes: See Table 10.

e. Findings for Architecture/Engineering

When the scope of the inquiry is limited to just the Architecture/Engineering industries, the results appear in Table 12. When we examine just the Architecture/Engineering industries, Model A identifies large, adverse, and statistically significant disparities in business formation rates in 2014-2018 for all minority groups and for women. The results for Model A show:

- For African Americans, the observed self-employment rate is 6.5 percent and the model predicts that it would be 5.2 percentage points higher—11.8 percent—if African Americans faced the same market outcomes as non-minority males. This yields a disparity index of 55.6.

- For Hispanics, the observed self-employment rate is 8.4 percent and the model predicts that it would be 3.4 percentage points higher—11.8 percent—if Hispanics faced the same market outcomes as non-minority males. This yields a disparity index of 71.1.

- For Asian and Pacific Islanders, the observed self-employment rate is 6.5 percent and the model predicts that it would be 5.1 percentage points higher—11.5 percent—if Asian and Pacific Islanders faced the same market outcomes as non-minority males. This yields a disparity index of 55.9.

- For American Indians and Alaska Natives, the observed self-employment rate is 6.2 percent and the model predicts that it would be 5.3 percentage points higher—11.5 percent—if American Indians and Alaska Natives faced the same market outcomes as non-minority males. This yields a disparity index of 53.7.

- For minorities as a group, the observed self-employment rate is 7.4 percent and the model predicts that it would be 4.5 percentage points higher—11.9 percent—if minorities as a group faced the same market outcomes as non-minority males. This yields a disparity index of 62.

- For non-minority females, the observed self-employment rate is 7.8 percent and the model predicts that it would be 4.2 percentage points higher—12 percent—if non-minority females faced the same market outcomes as non-minority males. This yields a disparity index of 65.4.

- For minorities and women as a group, the observed self-employment rate is 7.6 percent and the model predicts that it would be 4.7 percentage points higher—12.3 percent—if minorities and women as a group faced the same market outcomes as non-minority males. This yields a disparity index of 62.

Despite the addition of important qualifications and capacity variables, the results for Model B show that, for the economy as a whole, disparities in business formation rates remain large, adverse, and statistically significant even when we compare individuals that are similarly-situated in terms of their educational attainment, their geographic location, and their labor market experience. Specifically, the results for Model B show:

- For African Americans, the observed self-employment rate is 6.5 percent and the model predicts that it would be 3.6 percentage points higher—10.1 percent—if African Americans faced the same market outcomes as non-minority males. This yields a disparity index of 64.6.

- For Hispanics, the observed self-employment rate is 8.4 percent and the model predicts that it would be 1.6 percentage points higher—9.9 percent—if Hispanics faced the same market outcomes as non-minority males. This yields a disparity index of 84.4.

- For Asian and Pacific Islanders, the observed self-employment rate is 6.5 percent and the model predicts that it would be 4.4 percentage points higher—10.9 percent—if Asian and Pacific Islanders faced the same market outcomes as non-minority males. This yields a disparity index of 59.2.

- For American Indians and Alaska Natives, the observed self-employment rate is 6.2 percent and the model predicts that it would be 4.4 percentage points higher—10.5 percent—if American Indians and Alaska Natives faced the same market outcomes as non-minority males. This yields a disparity index of 58.6.

- For minorities as a group, the observed self-employment rate is 7.8 percent and the model predicts that it would be 3.1 percentage points higher—11 percent—if minorities as a group faced the same market outcomes as non-minority males. This yields a disparity index of 71.4.

- For non-minority females, the observed self-employment rate is 7.4 percent and the model predicts that it would be 3.1 percentage points higher—10.5 percent—if non-minority females faced the same market outcomes as non-minority males. This yields a disparity index of 70.5.

- For minorities and women as a group, the observed self-employment rate is 7.6 percent and the model predicts that it would be 3.3 percentage points higher—10.9 percent—if minorities and women as a group faced the same market outcomes as non-minority males. This yields a disparity index of 69.6.

In Model C, numerous additional variables are included that measure individual financial assets, family structure, mobility, immigration status, military status, and local macroeconomic conditions. Despite the inclusion of all these additional explanatory variables, the results still show that disparities in business formation rates remain large, adverse, and statistically significant when we compare individuals who are also similarly-situated in terms of these additional measures. The specific results for Model C show:

- For African Americans, the observed self-employment rate is 6.5 percent and the model predicts that it would be 3 percentage points higher—9.6 percent—if African Americans faced the same market outcomes as non-minority males. This yields a disparity index of 68.3.

- For Hispanics, the observed self-employment rate is 8.4 percent and the model predicts that it would be 1.8 percentage points higher—10.2 percent—if Hispanics faced the same market outcomes as non-minority males. This yields a disparity index of 82.3.

- For Asian and Pacific Islanders, the observed self-employment rate is 6.5 percent and the model predicts that it would be 4.9 percentage points higher—11.4 percent—if Asian and Pacific Islanders faced the same market outcomes as non-minority males. This yields a disparity index of 56.7.

- For American Indians and Alaska Natives, the observed self-employment rate is 6.2 percent and the model predicts that it would be 4.1 percentage points higher—10.3 percent—if American Indians and Alaska Natives faced the same market outcomes as non-minority males. This yields a disparity index of 60.3.

- For minorities as a group, the observed self-employment rate is 7.8 percent and the model predicts that it would be 3.4 percentage points higher—11.2 percent—if minorities as a group faced the same market outcomes as non-minority males. This yields a disparity index of 69.9.

- For non-minority females, the observed self-employment rate is 7.4 percent and the model predicts that it would be 3.1 percentage points higher—10.5 percent—if non-minority females faced the same market outcomes as non-minority males. This yields a disparity index of 70.5.

- For minorities and women as a group, the observed self-employment rate is 7.6 percent and the model predicts that it would be 3.5 percentage points higher—11.1 percent—if minorities and women as a group faced the same market outcomes as non-minority males. This yields a disparity index of 68.5.

Table 12. Actual and Potential Minority and Female Business Formation Rates, 2014-2018, Architecture/Engineering.

Race, Location	Current Business Formation Rate (%)	Expected Business Formation Rate (%)	Disparity Index
	(1)	(2)	(3)
Regression Model A			
African American	6.54	11.77	*55.56*
Hispanic	8.37	11.78	*71.05*
Asian and Pacific Islander	6.45	11.54	*55.89*
American Indian and Alaska Native	6.18	11.50	*53.74*
Two or More Races	8.68	11.92	*72.82*
Minority	7.40	11.94	*61.98*
Non-minority female	7.84	11.99	*65.39*
DBE	7.60	12.25	*62.04*
Non-minority male	12.15		
Regression Model B			
African American	6.54	10.13	*64.56*
Hispanic	8.37	9.92	*84.38*
Asian and Pacific Islander	6.45	10.89	*59.23*
American Indian and Alaska Native	6.18	10.54	*58.63*
Two or More Races	8.68	9.83	88.30
Minority	7.40	10.50	*70.48*
Non-minority female	7.84	10.98	*71.40*
DBE	7.60	10.92	*69.60*
Non-minority male	12.15		
Regression Model C			
African American	6.54	9.58	*68.27*
Hispanic	8.37	10.17	*82.30*
Asian and Pacific Islander	6.45	11.37	*56.73*
American Indian and Alaska Native	6.18	10.25	*60.29*
Two or More Races	8.68	9.85	88.12
Minority	7.40	10.49	*70.54*
Non-minority female	7.84	11.22	*69.88*
DBE	7.60	11.09	*68.53*
Non-minority male	12.15		

Source and Notes: See Table 10.

2. Discrimination Impacting Business Earnings

Even for those disproportionately few minority and female entrepreneurs who manage against the odds—as we have just seen from the results in Tables 10-12—to form their own businesses, their earnings from those businesses tend to lag far behind their non-minority male counterparts. These disparities, just as those observed with respect to business formation, tend to remain large, adverse, and statistically significant—even when other important non-discriminatory attributes are held constant.

a. Methods and Data

I examined deficits in business owner earnings between minorities, women, and their non-minority male counterparts using the same framework as above. Model A included only the race, sex, and time indicators, thus showing the raw disparities in earnings between the groups. Model B consisted of our set of qualifications and capacity controls, which include educational attainment, geographic location, and labor market experience. Finally, Model C included all the controls from Models A and B plus those for individual financial assets, family structure, mobility, immigration status, military status, and local macroeconomic conditions.

b. Economy-Wide Findings

As shown in Table 13, the baseline regression equation (Model A) includes only indicators for race, sex and time. This is the raw difference in earnings between minority and women business owners, one the one hand, and non-minority male business owners, on the other. The results for Model A show:

- African American business owners earned 46.2 percent less than non-minority male business owners from 2014-2018. In other words, for each dollar of business earnings accruing to non-minority males, African American business owners made just 54 cents.

- Hispanic business owners earned 26.9 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Hispanic business owners made just 73 cents.

- Asian and Pacific business owners earned 8.9 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Asian and Pacific business owners made just 91 cents.

- Native business owners earned 44 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Native business owners made just 56 cents.

- Minority business owners earned 29.9 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority business owners made just 70 cents.

- Non-minority female business owners earned 46.3 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, non-minority female business owners made just 54 cents.

- Minority and Female business owners earned 39.2 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority and female business owners made just 61 cents.

In Model B, which accounts for some common qualifications and capacity controls, we observe small changes in both directions for all the groups except Asian and Pacific Islanders, for whom the business earnings gap increases significantly compared to Model A. Specifically, the results for Model B show:

- African American business owners earned 44.8 percent less than non-minority male business owners from 2014-2018. In other words, for each dollar of business earnings accruing to non-minority males, African American business owners made just 55 cents.

- Hispanic business owners earned 26.1 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Hispanic business owners made just 74 cents.

- Asian and Pacific business owners earned 18.2 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Asian and Pacific business owners made just 82 cents.

- Native business owners earned 40.6 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Native business owners made just 59 cents.

- Minority business owners earned 30.9 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority business owners made just 69 cents.

- Non-minority female business owners earned 45 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, non-minority female business owners made just 55 cents.

- Minority and Female business owners earned 39.6 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority and female business owners made just 60 cents.

In Model C, which accounts for a large set of additional explanatory variables related to business owner earnings, we again observe small changes in both directions for all the groups except Asian and Pacific Islanders, for whom the business earnings gap increases significantly compared to Model B. Specifically, the results for Model C show:

- African American business owners earned 38.2 percent less than non-minority male business owners from 2014-2018. In other words, for each dollar of business earnings accruing to non-minority males, African American business owners made just 62 cents.

- Hispanic business owners earned 29.4 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Hispanic business owners made just 71 cents.

- Asian and Pacific business owners earned 28.9 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Asian and Pacific business owners made just 71 cents.

- Native business owners earned 36.9 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Native business owners made just 63 cents.

- Minority business owners earned 44.4 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority business owners made just 56 cents.

- Non-minority female business owners earned 33.3 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, non-minority female business owners made just 67 cents.

- Minority and Female business owners earned 41.1 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority and female business owners made just 59 cents.

All of these economy-wide findings are statistically significant at a 95 percent probability level or better.

Table 13. Minority and Female Business Owner Earnings Disparities, All Industries.

Race, Location	Business Earnings Deficit (%)	Cents Earned Per Dollar of Non-Minority Male Earnings
	(1)	(2)
Regression Model A		
African American	*-46.2*	*54¢*
Hispanic	*-26.9*	*73¢*
Asian and Pacific Islander	*-8.9*	*91¢*
American Indian and Alaska Native	*-44.0*	*56¢*
Two or More Races	*-45.3*	*55¢*
Minority	*-29.9*	*70¢*
Non-minority female	*-46.3*	*54¢*
DBE	*-39.2*	*61¢*
Regression Model B		
African American	*-44.8*	*55¢*
Hispanic	*-26.1*	*74¢*
Asian and Pacific Islander	*-18.2*	*82¢*
American Indian and Alaska Native	*-40.6*	*59¢*
Two or More Races	*-40.1*	*60¢*
Minority	*-30.9*	*69¢*
Non-minority female	*-45.0*	*55¢*
DBE	*-39.6*	*60¢*
Regression Model C		
African American	*-38.2*	*62¢*
Hispanic	*-29.4*	*71¢*
Asian and Pacific Islander	*-28.9*	*71¢*
American Indian and Alaska Native	*-36.9*	*63¢*
Two or More Races	*-37.9*	*62¢*
Minority	*-33.3*	*67¢*
Non-minority female	*-44.4*	*56¢*
DBE	*-41.1*	*59¢*

Source and Notes: Calculations by the author from the 2014-2018 ACS PUMS. Figures in italics are statistically significant at a 95 percent probability level or better.

c. Findings for Construction

As shown in Table 14, the baseline regression equation (Model A) includes only indicators for race, sex and time. This is the raw difference in earnings between minority and women business owners, one the one hand, and non-minority male business owners, on the other. The results for Model A show:

- African American business owners earned 40.4 percent less than non-minority male business owners from 2014-2018. In other words, for each dollar of business earnings accruing to non-minority males, African American business owners made just 60 cents.

- Hispanic business owners earned 12.4 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Hispanic business owners made just 88 cents.

- Asian and Pacific business owners earned 1.1 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Asian and Pacific business owners made just 99 cents.

- Native business owners earned 30.4 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Native business owners made just 70 cents.

- Minority business owners earned 17.3 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority business owners made just 83 cents.

- Non-minority female business owners earned 45.6 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, non-minority female business owners made just 54 cents.

- Minority and Female business owners earned 22.3 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority and female business owners made just 78 cents.

In Model B, which accounts for some common qualifications and capacity controls, we observe small changes in both directions for all the groups except Asian and Pacific Islanders, for whom the business earnings gap increases significantly compared to Model A. Specifically, the results for Model B show:

- African American business owners earned 39.9 percent less than non-minority male business owners from 2014-2018. In other words, for each dollar of business earnings accruing to non-minority males, African American business owners made just 60 cents.

- Hispanic business owners earned 11 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Hispanic business owners made just 89 cents.

- Asian and Pacific business owners earned 10.7 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Asian and Pacific business owners made just 89 cents.

- Native business owners earned 26.9 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Native business owners made just 73 cents.

- Minority business owners earned 18.5 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority business owners made just 82 cents.

- Non-minority female business owners earned 46.4 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, non-minority female business owners made just 54 cents.

- Minority and Female business owners earned 25.1 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority and female business owners made just 75 cents.

In Model C, which accounts for a large set of additional explanatory variables related to business owner earnings, we again observe small changes in both directions for all the groups except Asian and Pacific Islanders, for whom the business earnings gap increases significantly compared to Model B. Specifically, the results for Model C show:

- African American business owners earned 32.8 percent less than non-minority male business owners from 2014-2018. In other words, for each dollar of business earnings accruing to non-minority males, African American business owners made just 67 cents.

- Hispanic business owners earned 16.7 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Hispanic business owners made just 83 cents.

- Asian and Pacific business owners earned 21.6 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Asian and Pacific business owners made just 78 cents.

- Native business owners earned 22.2 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Native business owners made just 78 cents.

- Minority business owners earned 47.5 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority business owners made just 52 cents.

- Non-minority female business owners earned 22.5 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, non-minority female business owners made just 78 cents.

- Minority and Female business owners earned 30.7 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority and female business owners made just 69 cents.

With only one exception, once again, all of these findings for the construction regressions are statistically significant at a 95 percent probability level or better.[38]

[38] The sole exception is again the result in Model A for Asian and Pacific Islanders. However this result was not statistically significant.

Table 14. Minority and Female Business Owner Earnings Disparities, Construction.

Race, Location	Business Earnings Deficit (%)	Cents Earned Per Dollar of Non-Minority Male Earnings
	(1)	(2)
Regression Model A		
African American	*-40.4*	*60¢*
Hispanic	*-12.4*	*88¢*
Asian and Pacific Islander	-1.1	99¢
American Indian and Alaska Native	*-30.4*	*70¢*
Two or More Races	*-29.0*	*71¢*
Minority	*-17.3*	*83¢*
Non-minority female	*-45.6*	*54¢*
DBE	*-22.3*	*78¢*
Regression Model B		
African American	*-39.9*	*60¢*
Hispanic	*-11.0*	*89¢*
Asian and Pacific Islander	*-10.7*	*89¢*
American Indian and Alaska Native	*-26.9*	*73¢*
Two or More Races	*-28.3*	*72¢*
Minority	*-18.5*	*82¢*
Non-minority female	*-46.4*	*54¢*
DBE	*-25.1*	*75¢*
Regression Model C		
African American	*-32.8*	*67¢*
Hispanic	*-16.7*	*83¢*
Asian and Pacific Islander	*-21.6*	*78¢*
American Indian and Alaska Native	*-22.2*	*78¢*
Two or More Races	*-25.8*	*74¢*
Minority	*-22.5*	*78¢*
Non-minority female	*-47.5*	*52¢*
DBE	*-30.7*	*69¢*

Source and Notes: See Table 13.

d. Findings for Architecture/Engineering

As shown in Table 15, the baseline regression equation (Model A) includes only indicators for race, sex and time. This is the raw difference in earnings between minority and women business owners, one the one hand, and non-minority male business owners, on the other. The results for Model A show:

- African American business owners earned 59.2 percent less than non-minority male business owners from 2014-2018. In other words, for each dollar of business earnings accruing to non-minority males, African American business owners made just 41 cents.

- Hispanic business owners earned 16.3 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Hispanic business owners made just 84 cents.

- Asian and Pacific business owners earned 23.4 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Asian and Pacific business owners made just 77 cents.

- Native business owners earned 60.8 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Native business owners made just 39 cents.

- Minority business owners earned 30 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority business owners made just 70 cents.

- Non-minority female business owners earned 46 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, non-minority female business owners made just 54 cents.

- Minority and Female business owners earned 39 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority and female business owners made just 61 cents.

In Model B, which accounts for some common qualifications and capacity controls, we observe once again just small changes in both directions for all the groups except Asian and Pacific Islanders, for whom the business earnings gap increases significantly compared to Model A. Specifically, the results for Model B show:

- African American business owners earned 55 percent less than non-minority male business owners from 2014-2018. In other words, for each dollar of business earnings accruing to non-minority males, African American business owners made just 45 cents.

- Hispanic business owners earned 6.9 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Hispanic business owners made just 93 cents.

- Asian and Pacific business owners earned 28.1 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Asian and Pacific business owners made just 72 cents.

- Native business owners earned 70.5 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Native business owners made just 30 cents.

- Minority business owners earned 27.2 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority business owners made just 73 cents.

- Non-minority female business owners earned 43.4 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, non-minority female business owners made just 57 cents.

- Minority and Female business owners earned 36.7 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority and female business owners made just 63 cents.

In Model C, which accounts for a large set of additional explanatory variables related to business owner earnings, we again observe just small changes in both directions for all groups. Specifically, the results for Model C show:

- African American business owners earned 50.6 percent less than non-minority male business owners from 2014-2018. In other words, for each dollar of business earnings accruing to non-minority males, African American business owners made just 49 cents.

- Hispanic business owners earned 9.1 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Hispanic business owners made just 91 cents.

- Asian and Pacific business owners earned 30.7 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Asian and Pacific business owners made just 69 cents.

- Native business owners earned 71 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, Native business owners made just 29 cents.

- Minority business owners earned 45.1 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority business owners made just 55 cents.

- Non-minority female business owners earned 28.9 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, non-minority female business owners made just 71 cents.

- Minority and Female business owners earned 39.5 percent less than non-minority male business owners from 2014-2018. For each dollar of business earnings accruing to non-minority males, minority and female business owners made just 60 cents.

With only two exceptions, all of these findings for the Architecture/Engineering regressions are statistically significant at a 95 percent probability level or better.[39]

Table 15. Minority and Female Business Owner Earnings Disparities, Architecture/Engineering.

Race, Location	Business Earnings Deficit (%)	Cents Earned Per Dollar of Non-Minority Male Earnings
	(1)	(2)
Regression Model A		
African American	*-59.2*	*41¢*
Hispanic	-16.3	84¢
Asian and Pacific Islander	*-23.4*	*77¢*
American Indian and Alaska Native	-60.8	39¢
Two or More Races	*-39.0*	*61¢*
Minority	*-30.0*	*70¢*
Non-minority female	*-46.0*	*54¢*
DBE	*-39.0*	*61¢*
Regression Model B		
African American	*-55.0*	*45¢*
Hispanic	-6.9	93¢
Asian and Pacific Islander	*-28.1*	*72¢*
American Indian and Alaska Native	*-70.5*	*30¢*
Two or More Races	*-32.3*	*68¢*
Minority	*-27.2*	*73¢*
Non-minority female	*-43.4*	*57¢*
DBE	*-36.7*	*63¢*
Regression Model C		
African American	*-50.6*	*49¢*
Hispanic	-9.1	91¢
Asian and Pacific Islander	*-30.7*	*69¢*
American Indian and Alaska Native	*-71.0*	*29¢*
Two or More Races	*-27.9*	*72¢*
Minority	*-28.9*	*71¢*
Non-minority female	*-45.1*	*55¢*
DBE	*-39.5*	*60¢*

Source and Notes: See Table 13.

e. Conclusions from American Community Survey Data

This section has documented that when we examine the status of minorities and women compared to non-minority males in the industry segments relevant to federal surface and aviation transportation funding, the results look very similar to what we observe elsewhere in the economy.

[39] The exceptions are the results in Models B and C for Hispanics.

That is, even when other non-discriminatory factors are held constant using the statistical technique of regression analysis, the disparities in business formation rates between African Americans, Hispanics, Asians and Pacific Islanders, American Indians and Alaska Natives, and women, on the one hand, and their non-minority male counterparts, on the other, remain large, adverse, and statistically significant. I have documented such disparities in this testimony for the nation as a whole and throughout the states, and in the economy as a whole as well as in Construction and Architecture/Engineering, which are key industries with respect to federal surface and aviation transportation funding.

Furthermore, I have documented that even for those minority and female entrepreneurs who manage against the odds to form their own businesses, their earnings from those businesses lag far behind their non-minority male counterparts.[40] These disparities as well remain large, adverse, and statistically significant even when other non-discriminatory attributes are held constant.

These results are fully consistent with the conclusion that discrimination continues to adversely affect minorities and women operating in United States business markets, and in particular those markets that are relevant to federal surface and aviation transportation funding.

E. Overall Conclusions

In preparing this testimony, I conducted extensive original research using almost 100 previously produced disparity studies, and current and past data from the *Survey of Business Owners*, the *Annual Business Survey*, and the *American Community Survey*. This research is a continuation of similar research I have performed over the course of my career as an economist. Based on the findings presented above, I conclude that there is strong evidence, both past and present, of large, adverse, and statistically significant disparities facing minority-owned and women-owned business enterprises in the United States. Moreover, these disparities cannot be explained solely, or even primarily, by differences between the relevant populations in factors untainted by the effects of discrimination. These disparities are primarily due to discrimination, in the economy as a whole, as well as in the markets such as construction, architecture, and engineering that most relevant to federal surface and aviation transportation funding.

[40] In addition to the analyses of business owner earnings, I also ran comparable analyses on the annual earnings of wage and salary workers—as opposed to business owners—in the industry segments relevant to federal surface and aviation transportation funding as well as in the economy as a whole. Disparities facing wage and salary workers matter to the analysis of business enterprise discrimination because that is where much of the entrepreneurial talent pool starts—especially in industries such as construction, architecture, and engineering. Though not reported here, the results of the wage and salary regressions look very similar to those presented above—in the vast majority of instances, large, adverse, and statistically significant deficits were observed for African Americans, Hispanics, Asians and Pacific Islanders, American Indians and Alaska Natives, and non-minority women, as well as for minorities as a group and minorities and women as a group.

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